











THE  
**LONDON JOURNAL**  
OF  
**Arts and Sciences;**  
CONTAINING  
FULL DESCRIPTIONS OF THE PRINCIPLES AND DETAILS OF  
**EVERY NEW PATENT,**  
ALSO  
**Original Communications**  
ON OBJECTS CONNECTED WITH  
**SCIENCE AND PHILOSOPHY,**  
PARTICULARLY SUCH AS EMBRACE THE MOST RECENT  
**INVENTIONS AND DISCOVERIES**  
IN  
**Practical Mechanics.**

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**BY W. NEWTON,**  
CIVIL ENGINEER AND MECHANICAL DRAFTSMAN.  
**AND BY C. F. PARTINGTON,**  
OF THE LONDON INSTITUTION.

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- I. Hewes's Windmill ; Kilby and Bacon's Gas Burner ; and Harsleben's Propelling Apparatus.
- II. Kitchin and Smith's Window Frames and Shutters.
- III. Vaughan's Pump ; Dutton's Propelling ; and Tucker's Improved Cannon.
- IV. Banks' improvements in Steam Engines ; Davis's Sugar Boiling Apparatus ; Week's mode of heating Hot Houses ; and Jobbins's improved Stock for Fulling.
- V. Church's Knife Sharpener ; Brunton's Gas Apparatus ; Tucker's improved Projectile ; and Ventura's Harp Lute
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**JOURNAL OF ARTS AND SCIENCES,  
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*CONJOINED SERIES.*

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No. XXVIII.

**Recent Patents.**

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*To JOHN DYER, of Trowbridge, in the county of Wilts, engineer, for his invention of a machine for fulling, thickening, felting, and cleansing woollen cloth, or any other fabric requiring the process of fulling, thickening, felting, or cleansing in the course and process of the manufacture thereof.—[Sealed 13th August, 1823.]*

THE process of fulling, felting, or milling woollen cloth, appears to have been performed from the earliest period of practising the art by some sort of uncouth thumping apparatus; and to the present day, with the exception of the invention which forms the subject of this patent, a most clumsy and unwieldy machine called

the stock has been universally employed, which requires very great power to drive it, and when at work produces such tremendous noise and vibratory action as to endanger the stability of the building in which it is placed, and give considerable annoyance to the neighbourhood surrounding.

The object of the milling operation is to bring the loose fibres of the wool into close contact, by pressing and rolling the cloth in a moist state, which causes the fibres to adhere and to curl or entwine round each other, so as to constitute that compact adhesion of the wool called felting or fulling. This object appears to be most satisfactorily performed by means of rollers instead of beaters in the present machine, avoiding all the noise resulting from the thumping vibratory action of the stocks, and with the further advantage of being driven by a power very much inferior to that heretofore required for accomplishing the same result.

This invention consists in adapting rotary pressing rollers to be employed in a machine instead of beaters, for the purpose of bringing the loose fibres of woollen cloths into close contact, and causing such fibres to intermingle and lap round each other, thereby producing the matting and thickening effect commonly called fulling, felting, or milling.

Plate I., fig. 1, represents the front elevation of the machine, that is, the part at which the cloths are introduced; fig. 2, is an elevation of the right hand side of the machine, at which the driving rigger is attached; fig. 3, the left hand side of the same, exhibiting the driving gear; and fig. 4, the back end elevation or part where the cloths are delivered. For the better illustration of the working parts, fig. 5, is a longitudinal section

of the machine, taken vertically, representing the positions of the pressing rollers, conducting roller, and the form of the curved trough, by which the cloth, in a continuous or endless length, is carried through the machine, and submitted to the pressing or squeezing process ; fig. 6, is a horizontal section of the machine, showing the situation of such parts as are not so well seen in the other figures ; in all which several views the respective letters refer to the same parts of the machine : *a, a*, are the bed rollers or bearing rollers, the axles of which are supported in plummer blocks, fixed upon the upper edges of the horizontal side frames of the machine. Toothed wheels *b, b*, are also made fast to the axles of *a, a*, which are driven by an intermediate pinion *e*, fixed on the shaft of the rigger *d*.

The vertical pressing rollers *e, e*, are suspended above, and in positions coincident with the bed rollers *a, a*, their axles being mounted in the forked carriages *f, f*, which are enabled to rise and fall by means of guide shafts *g, g*, extending from the upper part of each carriage, and passing through sockets in the transverse bars at the top of the machine. On the axles of the pressing rollers toothed wheels *h, h*, are also affixed, which are made coincident with and taking into the teeth of the wheels *b, b*, below.

These wheels *h, h*, and rollers *e, e*, are kept in their correct positions by the ends of their axles working in vertical guide slots in the pendant arms *i, i*, affixed to the top rail of the frame.

The cloths to be submitted to the fulling, felting, or thickening process, must be passed between the bed rollers *a*, and the pressing rollers *e*, as shown in the section, fig. 5. The peripheries of these rollers are not brought into contact, but a small space is left between them ;

and the sides of those spaces are enclosed by the straight horizontal boards *j, j*, which are mounted in iron frames on each side, close to the rollers.

These straight horizontal boards are seen endwise in fig. 1; and the back parts of their iron frames are shown at *j, j*, in figs. 2 and 3. The iron frames are formed by flat plates with flanges within, and they are affixed to the standards of the machine by bolts and nuts passed through the pillars. One of these boards is represented detached at fig. 7, for the purpose of showing the blocks of wood *s, s*, or other hard substance, inlaid at those parts where the cloth rubs with considerable friction as it passes the vertical rollers. These blocks are found to answer very well if made of apple-tree wood; they must be occasionally replaced if worn, and kept flush with the other surface of the board. The flanges within the iron frames confine the boards, and they are brought up to their proper positions against the sides of the rollers (see figs. 1 and 6,) by wedges inserted between the board and its iron frame.

The pressing rollers *e*, are enabled to rise with their carriages *f*, by the shafts *g*, sliding upwards in their sockets whenever the substance of the cloth requires more space; but the necessary pressure upon the cloth, according to its quality, is constantly maintained by means of weighted levers *k, k*, which are made to bear upon the shafts *g*, of the forked carriages, thereby causing the rollers *e, e*, to press upon the cloth with a certain uniform force,

It will now be perceived that in order to submit cloth to the operations of this machine it must first be placed in the trough below (having been previously soaped or not, as may be deemed most desirable); and the commencement of the piece being introduced between the

rollers as described, and brought out behind, the two extremities of the length of cloth must be tacked together so as to form an endless piece. The rigger *d*, on the driving shaft being now made to rotate in the direction of the arrow shown in fig. 2, the wheels and rollers *a, a, b, b, e, e*, and *h, h*, will then all turn on their axles, and conduct the cloth forward through the machine in a wisp or wreathed form, that is, compressed together in width. If the cloth has not been previously soaped, or otherwise coated with a suitable adhesive matter, there should now be gradually distributed upon its surface such adhesive matter, in a liquid state, as the cloth proceeds through the machine.

The occasional pressure to which every part of the cloth is subjected, in passing between the vertical rollers, brings the loose ends of the fibres of the wool into contact with each other, and being thus held by the adhesive material, every successive squeeze which the cloth receives from the rollers, as it continues travelling through the machine, causes those fibres to be more intimately connected, and to coil round each other and mat together, producing that close intervention of the wool called felting, fulling, or milling.

As this part of the operation acts more immediately upon the fibres of the wool in the breadth or cross direction of the cloth, I find it desirable to introduce other rollers, pressing laterally, and partially resisting the progress of the cloth, so as to confine and push it up lengthwise. These rollers, made slightly bowl-shaped, are shown at *l*, and *m*, in figs. 4 and 5, turning upon vertical axles.

The roller *l*, is mounted in the machine at a short distance from the hinder pair of vertical rollers *a*, and *e*, its upright axle turning in fixed bearings; the roller *m*,

is supported in a similar position on the other side of the machine, by its upright axle turning in the forked carriage *n*, which slides in grooves in fixed bearings, supported by the framework. At the back of the carriage *n*, there is a stem *o*, passing through the framework, with a weighted lever *p*, acting against its outer end, which weighted lever tends to bind the roller *m*, towards the roller *l*. By the lateral pressure of these rollers, therefore, the progress of the cloth is impeded, and being thereby driven up into folds in the excavated space *r*, between the hinder pair of vertical rollers *a, e*, and the lateral rollers *l, m*, as shown in the section, fig. 5, the cloth, as it passes between the two last-mentioned rollers, is subjected to considerable pressure in lateral directions, which renders the operation more perfect by compressing, and thereby felting, thickening, or fulling the cloth in its length also.

The peripheries of the bed rollers *a, a*, and of the pressing rollers *e, e*, are to be made of wood. It is found convenient to use cast iron circular frames for the construction of these rollers, the frames having mortice holes round their rims, into which holes are driven a series of plugs of English oak, the grain of the wood standing radially; and when these plugs are all secured by lateral pins, the outer part or periphery of each roller is turned circular and true: they might, however, answer the purpose if slightly fluted. It is found that the most eligible dimensions for these rollers are about eighteen inches diameter, and from two to three inches thick; and that the second pair of rollers should be about half an inch thicker than the first pair, in order to prevent wrinkles in the cloth. The cogs of the wheels *b*, and *h*, require to be rather long, in order that they may remain in gear when the axles of the wheels *b*, are

slightly raised by the substance of the cloth passing between the rollers; and in order to prevent noise, it is preferable to make the cogs of the wheels *h, h*, of wood. The Patentee does not intend to confine himself to two pairs of rollers in a machine, as a greater number may be found to answer the purpose. The lower part of the machine forming the trough is enclosed by boards and shutters, as shown; and the wheels in front are cased in at the parts marked *z, z, z*, in fig. 1. In order, however, that the cloth may not become entangled in the wheels, but be properly conducted between the rollers, that casing is removed in the figure, for the purpose of showing the wheels and their axles in their proper positions.

After the fulling, felting, or thickening process has been sufficiently effected, the soap or other material in connexion with the cloth is partially cleansed out, by introducing a quantity of clean water into the trough at the flap *q*, behind; and then, by giving the cloth a few more turns through the rollers, a considerable portion of the foul matter will be expressed, and run off from the trough through an aperture at bottom. It is not, however, considered eligible to employ this machine for the ultimate cleansing of the cloths after fulling, as when the foulest part of the matter has been discharged, the cloths will be more conveniently and perfectly cleansed in the ordinary washing machine.

The Patentee concludes by stating, "Lastly, I wish it to be understood, that though I claim as my invention and exclusive right, under the above recited Letters Patent, the particular arrangement of machinery described, and its application to the purposes above stated, yet I do not intend to confine myself to that precise disposition and arrangement of the parts,

but claim any and every variation, therefore, in which narrow rollers are employed to perform the operation of fulling, felting, or milling of woollen cloths, and other fabrics requiring such process."—[*Enrolled in the Rolls Chapel Office, February, 1834.*]

Specification drawn by Messrs. Newton and Berry.

---

*To WILLIAM GUTTERIDGE, of the Minories, in the borough of the Tower Hamlets, civil engineer, and GEORGE STEVENS, of Norwood, in the county of Surrey, sugar refiner, for their invention of an apparatus for the manufacture and refining of sugar and other extracts, and applicable also to other purposes.*  
—[Sealed 21st December, 1832.]

THIS invention consists in an arrangement or combination of apparatus for boiling and evaporating syrups in the manufacture of sugar, on the principle of Howard's vacuum pans: such arrangement or combination of apparatus being also applicable in the process of evaporating and concentrating spirituous and other extracts obtained from other vegetable substances; likewise, in an apparatus or kiln for drying loaves of sugar.

In Plate I., the apparatus is shown in several views, similar letters of reference indicating corresponding parts.

Fig. 8, represents a longitudinal section of the boiling apparatus: fig. 9, a plan of the same: fig. 10, is a cross section, *a, a*, being the brick-work and flues in which the apparatus is set: *b*, a boiling pan, similar in construction to those known by the name of Howard's va-





cuum pans. This pan is placed within a jacket or outer vessel *c*, which is intended to act as a boiler for generating steam to produce a vacuum in the pan, and which is also the medium of communicating heat for boiling the syrup in the pan. An ordinary safety-valve *d*, is placed on the upper part of the boiler *c*, which regulates the degree of heat applied to the boiler, by the degree of pressure exerted upon the valve. A steam-pipe *e*, connects the upper part of the boiler *c*, with the boiling pan *b*, there being a stop-cock, by which the connexion is opened or shut off, as occasion requires.

A cover *g*, is fixed upon the upper part of the boiling pan, which forms a man-hole for gaining access to the interior. This cover is accurately fitted by grinding, in order that when a vacuum is obtained within the boiling pan, the atmospheric pressure may keep the joint air-tight. A pipe *i*, leads to the intermediate vessel *j*, and in the event of the syrup or other matter contained in the boiling pan accidentally boiling over, it will be received in the vessel *j*, from whence it may be drawn by the pipe and cock *k*.

At the bottom of the boiling pan *b*, there is a plug or valve *l*, opening into the trough *m* (see fig. 10), by which the charge may be withdrawn; this valve *l*, is opened or closed by the lever *n*.

The operation of boiling in vacuum, by means of Howard's apparatus, being well understood, it will not be necessary to enter into any particular of its construction.

So far as the boiling and evaporating pan is concerned, this improved apparatus is the same as is now in common use: the various appendages for ascertaining the pressure and temperature being omitted, to avoid complexity, as this invention does not relate to the process,

but only to the peculiar apparatus as improved for working such description of boiling pans.

Fig. 11, shows a longitudinal section of the apparatus for condensing the vapour or steam as it rises from the boiling pan, in order to keep up a vacuum; such vacuum being regulated by employing more or less condensing water, according as the evaporation is carried on with more or less rapidity. Fig. 12, is a plan of fig. 11, the upper part being removed, that the interior construction may be more clearly seen. Fig. 13, is a transverse section of fig. 11, by which the relative situations of the various parts will be perceived.

This part of the apparatus consists of the elliptical vessel *o*, the construction of which is clearly shown in the figures, and is called the vacuum vessel, or exhauster, within which is placed the condensing, refrigerating, or cooling apparatus *p*, consisting of four curved parallel plates, with collars or ribs between, all bolted together, and leaving three spaces between the four plates. The upper and lower spaces are intended for water; the middle space for the steam arising from the boiling pan.

A pipe *i*, leading from the boiling pan, opens to the middle space of the condenser *p*, but which may be shut off, when desired, by a cock; *s*, is the water supply pipe, connected to the upper and under water spaces of the condenser. The eduction pipe *t*, conveys off the water from the condenser, having lateral branch pipes *u*, *v*: that at *u*, is connected to the under water space, for the purpose of conveying water away therefrom by the pipe *t*. The other branch pipe *v*, is connected to the upper water space, and passes through a hole formed in the under water space.

It should be observed, that the holes through which the branch-pipes pass are sufficiently large, not only

for the passage of such branch-pipes, but also leaving a space all round them for the passage of the water, caused by the condensing of the steam, so that it may flow into the outer or vacuum vessel *o*, from whence it may be drawn off from time to time through the pipe *w*, which leads to a pump to be employed for that purpose.

Having described the improved apparatus so far as relates to the boiling of sugar, or solutions of other matter, from which it is desired to evaporate the aqueous parts, the specification proceeds to describe the parts of the apparatus intended to be used for facilitating the operation of stoving or drying the lumps or loaves of refined sugar: the action of which, in many respects, is similar to the apparatus already described, it depending on a constant approximation to a vacuum being kept up by a similar condensing apparatus attached to the stove. By this means the loaves or lumps will be more effectually dried throughout than by the ordinary means.

Fig. 14, is a section of the stove: *x*, is the casing within which the vacuum is to be preserved during the time of working. The vessel is cylindrical, having one hemispherical end. To the front a cover is fitted (by grinding), for the purpose of keeping it air-tight by the external atmospheric pressure, when a vacuum is formed within; it is secured by screw-clamps, as shown: *y*, is a steam-pipe, leading from a high-pressure boiler, passing round within the stove, in order to keep up the heat within it.

Within the vessel *x*, are formed ledges, on which shelves *z*, are placed, and on these shelves the loaves are ranged which are to be dried. At the lower end of the pipe *x*, the steam and condensed water passes off, after having heated the vessel: *i*, is a pipe leading to a

vacuum vessel, which it is not thought necessary here to show, as the same may be constructed similarly to that represented in figures 11, 12, and 13. There must be a stop-cock on the pipe, for cutting off the communication between the stove and the vacuum vessel.

A small cock in the top of the vessel admits air when it is desired to remove the cover for withdrawing the charge of dried sugar.

Having now described the manner of constructing the improved apparatus, the following is the manner of using it: In the first instance, water being placed in the outer vessel *c*, when steam rises it is permitted to flow through the pipe *e*, into the boiling pan *b*, and thus drive out the air contained therein through the plug or valve *l*, which is opened for that purpose; and the air contained in the vacuum vessel *o*, will be driven out in consequence of steam being admitted for that purpose. The whole of the apparatus will thus be full of steam. The cocks are then to be closed, and a flow of water is to take place through the pipe *s*, which may be connected to a tank above, or by any other convenient means: this will quickly condense the steam contained in the apparatus, and the boiling pan may now be charged with syrup, or other matter to be operated upon; and as the steam rises therefrom, it will pass through the pipe *i*, between the cooling surfaces, as above described, and become condensed, and will fall through the holes (at which the branch pipes *v*, pass) to the bottom of the vessel *o*, from whence it may be pumped from time to time, as before explained.

In the event of the steam from the boiling pan *b*, rising quicker than it can be condensed, it will then be desirable to use the jet pipes, which are connected with the vessel *o*, as well also as the pipes *i*, which will

quickly overcome any sudden generation of steam which might be caused by the heat of the fire rising suddenly.

It will be evident that if a pump be connected to a refrigerating worm, or other similar apparatus immersed in cold water, and the liquid so pumped out of the vacuum vessel be thus made to pass through the same, it will be more perfectly refrigerated, and may be received as spirit from a still. Hence, if wash or other spirituous liquor be submitted to the boiler *b*, instead of syrup, this apparatus will answer all the purposes of a vacuum still.

Having described the manner of using the apparatus applicable to boiling, those parts for the purposes of drying will be readily understood.

A charge of loaves of sugar is to be placed on the various shelves, and the cover of the vessel confined to its place. A vacuum is then to be obtained within the vessel by steam, as above described, passed through the pipe *i*: the cock on this pipe is then to be opened, when part of the air will flow from the stove into the vacuum vessel: the cock on the pipe *i*, is then to be closed, and a fresh vacuum to be obtained in the vessel. This mode of proceeding is to be continued until a sufficient vacuum is obtained in the stove; then the cock on the pipe *i*, is to remain open, and steam being permitted to flow through the pipe *y*, will heat the stove, and cause steam to be evaporated from the lumps or loaves of sugar: which operation will be greatly facilitated by the vacuous state of the stove, and the continual withdrawing of the steam therefrom, and by its becoming condensed as fast as it reaches the vacuum vessel; by which means the operation of drying or stoving of sugar loaves will be materially improved.

In order to remove the charge from the stove, the stop cock on the pipe *i*, is to be closed, and the other cock be opened for the admission of air; the cover may then be removed.

Having described the manner of constructing this apparatus, and the manner of combining and using the same, we would have it understood, that although we have described various parts which are separately well known, we do not therefore claim them in their separate condition, but only when combined into apparatus according to our invention; nor do we confine ourselves to the precise forms shown and described, as they may be varied. But what we claim as our invention is, first, the combining the vessels *b*, *c*, *p*, *o*, into an apparatus for boiling in a vacuum, whereby the single boiler *c*, becomes the means of applying heat to the boiling pan *b*, and supplying steam to the purpose of producing a vacuum in the whole of the apparatus, whether for boiling syrup, or for the other purposes, as above described; and may be attached to the apparatus for drying the sugar in the stove above described, and also for producing a vacuum in that part of the apparatus.

And, secondly, we claim the apparatus hereinbefore described, for drying loaves or lumps of sugar in a vacuum, whether such apparatus be connected with the other apparatus, as above mentioned, or worked from a separate steam boiler.—[*Enrolled in the Enrollment Office, June, 1833.*]

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**To JOSHUA BATES, of Bishopsgate-street, in the city of London, merchant, for an improved method of condensing aeriformed substances and refrigerating fluids; communicated to him by a foreigner residing abroad.—[Sealed 13th January, 1834.]**

IN this improved method of condensing aeriformed substances and refrigerating fluids, the refrigerating or cooling agents or mediums employed are a current of atmospheric air, and warm water of the same or nearly the same temperature as that of the vapours which are to be operated upon. This method of condensing and refrigerating may be applied to the condensation of the vapours arising from the boiling of saccharine juices, of saline liquors, of distilled vapours, and the exit steam from engines; also to the cooling of brewers' worts, and to other purposes where condensation and refrigeration is required.

In describing this apparatus the Patentee states that, for the better illustration of its principles, he will endeavour to explain the physical laws on which it is founded. Without going into the minute details of an apparatus which may be variously constructed as to forms and proportions, he describes the general features of an apparatus to be applied to condensing of aqueous vapours evolved from an alembic, boiler, or sugar pan, and of refrigerating the liquid proceeding from such condensation.

In Plate I., fig. 15, represents merely a sketch or diagram of the general features of an apparatus constructed and combined upon the principles which are proposed to be employed, which will serve to explain the nature of this improvement. Let A, be the source of the vapours, or the vessel, boiler, alembic, or closed pan that contains the

liquid or syrup to be evaporated or concentrated. The pipe B, through which the vapour passes as it rises in the boiler, is surrounded by another tube C, of larger diameter closed at both ends. A pump D, draws from the reservoir E, warm water, which water has been heated by its previous and continual passage through the apparatus in contact with the surface of the vapour pipes. This pump forces the water by the pipe F, into the annular space or chamber between the pipes B and C, in which chamber, by its immediate contact with the pipe B, it acquires the temperature of the vapours intended to be refrigerated. The pipe G, conveys the water from the pipe C, into the annular colander or sieve H, which has a multitude of small holes pierced through its under part, and from whence the warm water descends in the form of a continued shower of rain. To the end of the pipe B, a distiller's worm I, I, is connected, which is placed beneath the colander H. The entire length of the worm-pipe should be bound round with linen or cotton cloth as a conductor of the heat, which cloth will be continually moistened by the rain in its descent from the colander. As this water has been heated in passing along the tube C, the shower of rain descending from the colander will be at a higher temperature than that of the atmosphere, and consequently, by heating the surrounding air as it descends, a considerable upward draft will be produced through the coils of the worm-pipe.

If the colander and the worm-pipe are enclosed within a chimney or upright tube as K, K, open at top and bottom, a current of ascending air will be produced within it by the descending shower of hot water, similar in effect to that which would be produced in a chimney

communicating with a furnace, or to that of the burner of an Argand lamp. Consequently, it will be perceived that in opposition to the descending rain a strong upward current of air will blow through that part of the cylinder K, K, which is beneath the colander. When the air first enters the lower aperture of the chimney or tube K, it is of the same temperature and moisture as the external atmosphere; but in its passage up the tube it meets with a warmer and damper atmosphere, caused by the heat given out from the hot fluid continually passing through the pipes, and by the hot shower of rain, and also by the steam evolved from the surfaces of the coils of the worm, which are continually wetted by the descending rain, the evaporation being considerably augmented by the cloth bound round the worm-pipe retaining the water as it descends in drops from coil to coil.

The atmosphere within the tube being of a higher temperature than without, a current of air constantly ascends and escapes at the upper aperture K, and its place be supplied by fresh air from the surrounding atmosphere, entering the tube below. The fresh air thus admitted at the bottom of the tube being cold and dry, will be suited to take up the heat and moisture within, because the water within the tube being in a state of dispersion, as rain presents to the air many points, or a very extended surface, and also because it is of a higher temperature than the air; and, besides, cold dry air is continually renewed, and a source of warmth is furnished by the latent caloric to the steam as fast as it is evolved. Thus a portion of the descending rain, or water, is evaporated, and the effect of this evaporation is to subtract caloric not only from the water held in contact with the coils of the worm-pipe by the cloth

enveloping it, but also from the hot vapours which pass through the worm. This process of evaporation has, therefore, a cooling power, which is but slight in the lower part of the chimney or tube K, because the temperature of the water, or rain, and of the worm, at this part, are of a lower temperature; but its refrigerating power increases as it rises towards the colander, and there it acquires its maximum of intensity, so that at any point between the lower aperture of the cylinder and the colander, the current of air is always a little cooler than the atmosphere of the region through which it passes (that is, at its maximum); and in passing this region of higher temperature, it is not only put in equilibrium of temperature, but also made to take up an additional quantity of aqueous vapours, which equalises the new temperature it acquires with its capacity of saturation. The cooling caused by the evaporation acts in an incessant and progressive manner from the lower aperture of the cylinder to the under side of the colander; and this cooling not only acts as an agent of the evaporation which the current of air cools, but it refrigerates also, because it becomes warmed in abstracting caloric from the vapours or liquids passing through the worm; and this refrigeration acts also incessantly and progressively from the lower part of the tube or chimney to the colander.

The Patentee states in conclusion, that "the velocity or force of the current of air that passes through the chimney or tube K, can be accelerated by artificial means, either by conducting the air and vapour passing from the upper aperture of the cylinder into the chimney or flues of a furnace, or by means of a revolving, forcing, or exhausting fan, or ventilator, or any other contrivance which will produce an increased current of air,

but which it is not necessary to be particularly described, as I only wish to explain the principles of a simple apparatus, constructed in any convenient form; and I would remark, that the area of the lower aperture through which the air is introduced into the chimney or tube K, and also the area of the upper aperture, or that through which it passes to the atmosphere, should be in accordance with the effect intended to be obtained.

“ It is further to be remarked, that in order to obtain from this apparatus the best effect, the velocity of the current of air must be itself a maximum; and as the speed or velocity of the current of air is owing to and determined by the excess of the temperature of the descending water, or rain, and of the coils of the worm to that of the exterior atmosphere, it ensues that the temperature of the water, or rain, must be a maximum. But this excess of temperature is a maximum only when the source of the rain is at the same temperature as the vapours to be condensed: if less warm, it would attract less air; or if warmer, it would augment the temperature of the vapours intended to be condensed. Consequently, the shower of water employed in the tube K, as the agent for cooling, bestows its maximum of effect when it is as warm as the vapours to be condensed; therefore, I may express this proposition, viz.—‘ That in refrigerating with water, less of it may be expended when it is warm than when it is cold, and that the least quantity of water will be evaporated when it is as warm as the aqueous or spirituous vapours upon which it is to operate.’

“ This proposition may appear strange, nevertheless it is conformable to the laws of nature; and appears only strange, because until now warm water has not been employed with currents of air for refrigerating.

Hence it is necessary to raise the temperature of the water in the colander to temperature of the vapours to be condensed: therefore, I cause the lukewarm water, pumped from the reservoir E, to circulate in the chamber C. In this circulation it also begins to act as a refrigerating medium, taking up a portion of heat from the vapours that pass through the pipe B, and afterwards it acts as a further condenser in the cylinder in the way described. Finally, the portion of this water that is still in the fluid state, after having fallen down from coil to coil, arrives lukewarm on to the inclined surface L, which conducts it into the reservoir E, from whence it is pumped up into the chamber C, as before described.

“The tube or chimney K, may have more or less altitude; the higher it is the greater the current produced. The force or velocity of the current of air can be governed by the areas of the introduction and exit apertures. If the cylinder rises only to the height of the sieve, the effect is much less than when it is prolonged beyond this height. I would further remark, that if the cylinder was removed, a slight effect might be produced, provided that a current of air be preserved in the cylindrical space limited by the coils of the worm, and also if the current was produced between the coils; or a central passage might be formed in an apparatus of another shape than that above described.

“I have only shown the application of the worm, because intending only to explain the principles of this method of condensing and refrigerating.

“The small quantity of water wasted in this manner of condensation, (that is, that portion passed off to the atmosphere in the form of vapours, at the upper aperture of the cylinder K,) may be replaced by a small

stream of cold water, which may be brought to the apparatus, and perhaps most conveniently introduced into the reservoir E, or into the chamber between the pipes B and C. When operating upon aqueous vapours, the waste of water is always less in weight than that of the vapours liquefied. When this apparatus is applied to the purposes of distillation, the end of the worm should terminate in a vessel M, which is to receive the produce of the condensation. It will be seen that this improved process is applicable to various purposes where condensation or refrigeration is required; for instance, in the boiling or concentration of sugar—to condensing and refrigerating distilled vapours, or steam, or saline liquids, either in vacuum or not—to cooling brewers' worts—and to the refrigeration of other liquors, or any other processes, when it may be required."—[*Inrolled in the Rolls Chapel Office, July, 1834.*]

Specification drawn by Messrs. Newton and Berry.

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**To JOHN BAPTISTE CONSTANTINE TORASSA, of Newington-causeway, in the county of Surrey, gentleman, PAUL ISAAC MUSTON, of Austin-friars, in the city of London, merchant, and HENRY WALKER WOOD, of the same place, merchant, for certain improvements in making or producing the pigment commonly known by the name of white lead, or carbonate of lead, being a communication made to them by a foreigner residing abroad.—[Sealed 11th December, 1833.]**

THE ordinary mode of preparing the pigment called white lead, is by subjecting lead in its metallic form to the action of an acid, which, assisted by heat, corrodes

the metal, and produces by precipitation, when washed, a white powder, which forms the pigment.

In the improved process neither acid nor heat are to be employed, the pigment being produced by mechanical means, assisted by the action of the atmosphere.

The metal is to be reduced to small pieces about the size of shots; indeed, it is proposed that the same process be adopted as that by which patent shot is usually made.

These small pieces of lead are then placed with a quantity of water in a vibrating tray, mounted upon a horizontal axle, and reciprocating motion being given to the tray by the hands of the workman, the pieces of lead are made to roll over each other to and fro in the tray; and by the surfaces being abraded by the friction, small portions of the lead are rubbed off until the whole becomes pulverised and mixed with the water.

The solution or mixture of lead, dust, and water, is then exposed to the atmospheric air until the water is evaporated, by which time the atmosphere having acted chemically upon the powder, it becomes carbonated and converted into the white pigment called white lead, without the employment of acid, vinegar, or other acetoos chemical matter, or without the application of heat.—[*Entered in the Inrolment Office, June, 1834.*]

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*To NEIL ARNOTT, of Bedford-square, in the county of Middlesex, Esq., for his invention of certain improvements on metallic pens and on pen-holders.—[Sealed 25th January, 1834.]*

THIS invention of certain improvements on metallic pens and on pen-holders consist, first, in giving to writing

pens and to pen-holders a longitudinal elasticity; that is, an elasticity which allows the length of the pen, or the distance between the nibs and the writer's fingers, to vary according to the pressure given by the hand, and which elasticity being in the direction of the length of the pen, may be called longitudinal; and, secondly, in constructing pens with three or more nibs, which will open and increase the breadth of the stroke by the pressure of the hand of the writer, and afterwards close, and produce a finer stroke as the pressure is removed or decreased.

The longitudinal elasticity above mentioned (together with the lateral elasticity belonging in common to all writing pens), gives increased freedom to the motion of the hand of the writer; and the Patentee proposes to obtain this longitudinal elasticity either by applying to the holder or stock of the pen a spring or elastic substance, which will yield in the required direction, or by giving certain forms or positions to parts of the pen itself, by which this longitudinal elasticity can be obtained without the aid of the spring, or elastic substance in the holder, or by combining the two methods together.

The several figures in Plate II., will serve to explain one method of carrying this improvement on pens and pen-holders into effect; although the Patentee does not mean or intend to confine himself to the precise form or construction hereinafter described, as there are many ways of effecting the same object, but which it will not be necessary for us particularly to explain. Fig. 1, is a longitudinal section taken through a pen-holder on this improved construction, with the longitudinal elasticity adapted to it: *a*, is the common metallic or other pen which is placed in the holder *b*:

This holder may be constructed in the same manner as common holders for metallic pens, and is connected by screwing, soldering, or otherwise, to the guide rod *d*, which passes through guide plates *e*, *e*, at the top and bottom part of the stock or handle of the holder *f*, *f*. A metallic spiral, heliacal, or other formed spring *g*, is placed between the holder *b*, and the bottom guide plate *e*. The upper end of the guide rod *d*, has a screw formed upon it; and *h*, is a nut or collar which is screwed upon its end. By means of this nut and screw any degree of elasticity required can be given to the pen by turning the nut *h*, round, which will raise or lower the guide rod *d*, and compress or release the spring *g*, thereby increasing or diminishing its tension, and producing a softer or harder pen.

It will be seen that the lower part of the case of the stock or holder may be made to cover the spiral or other formed spring, and that this spring may be connected at its ends to the holder *b*, and the lower guide plate *e*, if found desirable; and that while the spring *g*, is yielding to the pressure of the hand, the guide rod *d*, will always keep the pen in its proper position. It will be evident that any elastic substance or material, as caoutchouc or India rubber, may be used in place of the metallic springs above described; and that these elastic springs or substances may be placed in other situations in the holder than that shown in the figure; for instance, they may be placed pressing between a collar formed on the guide rod *d*, and the top or end of the case of the handle or holder *f*. This longitudinal elasticity may also be obtained, as before stated, by giving a peculiar form to the metallic pen itself. Fig. 2, shows one of these improved pens; *a*, is the shank or part

which is introduced into the holder ; *b*, is the nib or writing part, and which holds the ink, and is connected to the shank by the elastic spring *c*. It will be perceived that the points of the nibs of the pen are bent down so as to be nearly in a line with the axis of the handle, and that the parts of the nibs which hold the ink are in nearly a horizontal position ; and, further, that the elasticity is divided between the nibs *b*, and the spring *c*, and that by the pressure of the hand in writing, the same effect will be produced in this pen as in the pen and holder above described.

The second feature of these improvements is shown at figs. 3 and 4. Fig. 3 is a longitudinal section taken through one of the improved pens, with three or more points or nibs, and which points produce a broader or narrower stroke, according to the increased or diminished pressure of the hand of the writer, and discharge the ink very freely, owing to the number of channels acting by capillary attraction on the ink towards the point. The lower or writing part of this pen must be held nearly in a vertical position, at whatever angle the handle or holder is attached to it. The handle or holder is in this instance constructed nearly the same as in fig. 1, and the same letters are used to denote similar parts, as in that figure. The holder *b*, in this instance, is a solid piece of metal, into which three or more points *a*, *a*, *a*, are fixed, like the legs of a tripod, with their ends or nibs meeting in a point ; *c*, is a small metal disc, with three or more holes formed in it, through which the points or nibs *a*, *a*, pass.

This disc *c*, is firmly attached to the stock or holder by the piece *i*, which is fastened to it at one end, and soldered, or otherwise secured at the other, to the stock or holder *f*. On pressure being applied to the

handle, the disc *c*, will be made to descend, and force the nibs asunder, and at the same time compressing the spring *g*; but on removing that pressure, the spring will be free to draw back the disc *c*, and the points *a*, *a*, to collapse. Fig. 4, shows another modification of this description of pen, in which the longitudinal elasticity is obtained in the points or nibs of the pen itself: *a*, is a simple stock or handle, with a metallic plate *b*, affixed upon its end; *c* and *d*, are two pen points or nibs, which are each connected to the plate *b*, by springs *e*, *f*; (the third nib not being shown in the figure;) the nib *c*, is connected to the plate *b*, by the spring *e*, and the other nib *d*, by the spring *f*, these supporting springs crossing each other. It will be seen that any pressure upon the handle or stock will produce the same effect as that described in fig. 3, viz. the opening of the nibs, and producing a broader stroke of the pen in writing.

—[*Enrolled in the Inrolment Office, July, 1834.*]

Specification drawn by Messrs. Newton and Berry.

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*To WILLIAM MORGAN, of Penton-row, Walworth, in the county of Surrey, plumber and glazier, for his invention of an apparatus for heating and ventilating churches, conservatories, houses, and other buildings and places.—[Scaled 18th January, 1834.]*

THIS apparatus, for heating and ventilating churches, conservatories, houses, and other buildings and places, consists of an enclosed fire-place, stove, or grate, with an apparatus connected thereto for feeding the same with a sufficient quantity of fuel at proper intervals,

without requiring the attendance of any person during the time that the apparatus continues charged; this feeding apparatus is brought into operation at the required periods by a piece of clock-work or other mechanism, which causes a certain quantity of fuel to be discharged from the apparatus on to the fire at the times required. To the stove, or enclosed fire-place, is also connected proper boilers, chambers, pipes, tubes, valves, and cocks, to form an apparatus capable of heating water or air, or generating steam; and afterwards distributing such heated air, water, or steam, through rooms or buildings, or other places, as required. The Patentee states, that many different plans for heating and ventilating buildings with hot air, water, and steam, have before been invented and carried into effect: he, therefore, does not mean or intend to claim as his invention the heating of buildings or places with steam, hot water, or air; nor does he claim separately any of the boilers, pipes, tubes, valves, or other parts, which must necessarily be used in common in all apparatus of this nature, but claims as his invention, the apparatus hereinafter particularly described for feeding the stove or fire-place with fuel at the required periods; as this apparatus, when connected with a stove or fire-place, and its other appendages, forms an essential part of an apparatus for heating or ventilating.

The several figures in Plate II., exhibits different views of this apparatus for heating and ventilating. Fig. 5, is a transverse section, taken vertically through the fire-place, feeding apparatus and boiler. Fig. 6, is a longitudinal section, taken through the feeding apparatus, the front part of the stove being removed, the better to show the parts. Fig. 7, is another longitudinal section, taken through the boiler and fire-place, behind fig. 6, showing

the arrangement of the hot-water tubes or passages connected thereto : *a, a, a*, is the outer casing of the enclosed fire-place and feeding apparatus ; *b, b, b*, are a series of boxes to contain the coal, or other fuel, for supplying the fire. The arrangement of these boxes are shown best in fig. 8, which is a top view of the feeding apparatus ; the covers, or upper part of the outer casing being removed ; the bottoms *c, c, c*, of each of these boxes are formed as flaps or shutters turning upon hinge joints, and, when closed, are fastened by pins or bolts *d, d, d*, passed through staples on the bottoms and sides of the boxes. These pins or bolts *d, d*, are each connected to chains or cords *e, e, e, e*, passed over small guide rollers, and fastened to a drum or roller *f* ; which drum is again connected by the chain *g*, to the barrel *h*, mounted on a shaft, one end of which turns in a bearing on the top part of the feeding apparatus ; the other end being connected to the clock or jack escapement, or other retarding mechanism contained in the case at *i*. The apparatus is put in action by winding up the weight and cord *k, k*, which is coiled round the drum *f* ; at the same time, the cords or chain *e, e*, will be uncoiled and hang loose, as shown in fig. 2. These cords or chains *e, e, e, e*, are each of different lengths ; and this difference of length in the cords or chains determines the different spaces of time between each operation of feeding, for as the weight *k*, descends gradually, (it being governed by the escapement at *i*,) it causes the drum *f*, to revolve and coil on to it the several cords or chains *e, e, e*, and thereby to draw out of the staples the pins or bolts *d*, at different periods, and release the bottoms or flaps *c, c*, of the boxes, when they will immediately open, and the coal or other fuel fall down through the guide hopper *l*, into the second

hopper *m*, which has a pair of self-acting shutters or flaps *n*, *n*, with counterbalance weights connected to them for the purpose of keeping the flaps closed at all times, excepting when the coal is in the act of falling through them, at which time the superior weight of the coal forces the flaps *n*, *n*, open, but they immediately close after the fuel has passed through. The coal in its further progress to the fire falls upon the inclined plane *o*, which conducts it into the fire-place *p*. The boiler *q*, *q*, surrounds the fire-place without brick or mortar, and is divided into two compartments by the partition across the middle; the lower compartment *p*, being occupied as the fire-place, and the upper one *r*, as a hot-air chamber, through which the smoke and vapour pass in the direction of the arrows to the chimney *s*. There is another compartment or chamber *t*, shown, connected to the boiler by the neck *u*. This compartment is for the purpose of receiving the steam. When hot water is used as the medium of heating, the supply of water can be received into this compartment by the ball-cock *v*, or in any other convenient way. There also must be gauge-cocks placed in the boiler to show the height of water. When using my apparatus for heating and ventilating buildings with hot water, I connect the distributing pipes or chambers to the boiler as at *w*, fig. 7, and as the greater extent of surface in these distributing pipes produces an increased effect. The Patentee prefers making them as represented at *x*, *x*, that is, flat and narrow, but round or other shaped pipes or tubes may be used, if thought desirable. The hot water passes first through the upper range of pipes or tubes, and returns to the boiler by the lower range, after parting with a portion of its heat to the surrounding atmosphere, thereby keeping up a constant circulation

of hot water. The distributing pipes should be furnished with proper valves and cocks to regulate the supply of hot water to the degree of heat required in the building, and which may also be in a great measure regulated by the quantity of fuel supplied to the fire at the different feedings, and also by the longer or shorter time which is allowed to elapse between each feeding. When using steam as the heating medium, the distributing pipes, as shown in the drawing, for hot water are dispensed with, and the steam taken direct from the upper part of the boiler by the pipe *y*, and distributed over the building, as circumstances may dictate, in pipes or tubes furnished with proper safety valves, cocks, and exit pipes for the condensed steam. When hot air is the heating medium employed, the space occupied by the boilers may be filled with hot-air chambers and tubes, where the air can be heated, and afterwards distributed through the building by a rotatory fan, or other blowing apparatus, which will cause a circulation, but which it will not be necessary for me to describe, as there are various ways of carrying it into effect; and the arrangement of the same must depend upon the circumstances under which it is applied. The Patentee states, in conclusion, that "having now described my apparatus for heating and ventilating buildings, I need only remark, that I consider the second hopper with its self-closing shutters an essential part of this apparatus, as it prevents any downward draught of cold air having access into the upper part of the fire; and sometimes I find it convenient, when the extreme regularity of feeding is not required, to construct an apparatus without the fuel-boxes *b, b*. In such case I fill the part occupied by them, and also the first and second hopper, with fuel, and allow it to be gradually consumed by the first below:

and when the fuel has all passed through the shutters *k*, they will close, and prevent the cold air getting to the fire. I would further remark, that this apparatus may be fixed or made portable as may be required, and that the clock escapement may be actuated by a spring, instead of the cord and weight *k*, *k*, as described above; and further, that I prefer closing the mouth of the fire-place with double doors, as shown at *z*, *z*, in fig. 1, and that the covers of the fuel-boxes be as nearly air tight as possible, and that the air to support combustion in the fire-place be admitted at the under part of the grating or fire-bars."—[*Inrolled in the Rolls Chapel Office, July, 1834.*]

Specification drawn by Messrs. Newton and Berry.

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## ORIGINAL COMMUNICATION.

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*To the Editor of the London Journal of Arts, &c.*

### ON SUGAR REFINING, AND DR. URE'S EXPERIMENTS.

THERE is scarcely any branch of domestic industry which has stronger claims to the attention of our Government than the sugar refinery of this country. As a branch of our colonial trade, it is of great importance; as a manufacture continually advancing upon principles of scientific improvement, its details and operations have for some years past attracted much public attention. The insertion of the whole of Dr. Ure's experiments and long report in this journal, attest the interest which men of science attach to the process, and will be my excuse for some detailed observations upon those experiments. They were made by direction of the Board of Trade for the purpose of correctly ascertaining the quantity of refined sugar and extracts which

could be produced from one cwt. of raw or clayed sugar, in order to enable the Government to adjust in an equitable manner the amount of drawback which should be allowed as an equivalent to the amount of duty paid upon the one cwt. of colonial sugar.

The refiners, as a body, have been naturally indisposed to state the maximum quantity of refined produce from the one cwt. of raw material, not because they would throw a small additional drawback into the exporter's hands, but because the maximum produce is continually varying, according to various improvements adopted by the several refiners; and because the details of the refinery as to what quantity shall be produced in the course of continued operations from the cwt. of raw, must necessarily depend upon the judgment each refiner entertains of the relative state of the home, including the export market, with the raw sugar market. Which judgment must guide him as to the conversion of the great bulk of his inferior syrups into sugar that shall be just entitled to the bounty, or into Basseterre, commonly called bastard, of which little or none is exported, and into treacle, which claims no drawback. Dr. Ure has communicated so many of the arcana of the sugar refinery in his report, that I may be allowed to add the single secret upon which the whole process mainly rests as to profit or loss, the grand object of concern at the close of this very complicated manufacture. These preliminary observations are necessary to the clear apprehension of the effect and consequences induced by the various scientific improvements made of late years in the production of refined sugar. The principal of these improvements may be stated to be Dr. Howard's invention of boiling the syrups in *vacuo*, and the almost simultaneous use of animal charcoal; vegetable charcoal had been used for some time previous to the introduction of animal charcoal. Scientific readers need not be informed that the effect of boiling the syrups in *vacuo* must be the production of a larger proportionate quantity of refined extract than can be procured under the open-pan process, which, by the intensity of

the fire under the pan, carbonises, to a certain extent, the syrup subjected to this operation. But men of science are not generally aware that sugar produced in the low temperature of the vacuum-pan or of bath-pans, will not stand the action of sea-damp in a long voyage in any thing like the degree that open-pan refined sugar will. The exporters are fully aware of this fact. Dr. Ure found that "damage was done by slow evaporation," page 140; and his first "loaves were not only porous, but so devoid of cohesion, that falling into powder they had to be worked up again."—Vide p. 140, and Table I, p. 205.

Howard's process of boiling in *vacuo* is, however, an important and beneficial discovery; it undoubtedly produces a larger quantity of refined sugar of a superior quality as to whiteness and brilliancy; and the public, by means of this and other improvements, have their finer sugars cheaper. The superior advantages derived from these improvements relate also to the quantities more rapidly turned into the market. But I am decidedly of opinion that a given quantity of Howard's patent sugar does not sweeten to the extent that open-pan sugar of the same or inferior complexion does; nor will it, I apprehend, give, after fermentation, an equal quantity of alcohol by distillation: which alone indicates the relative quantity of saccharine principle or matter contained in any given quantities of sugar—either raw or refined. Upon the subject of vacuum refining I may just observe, that the original cost of the steam-engine, and the apparatus generally, is excessive. It is highly probable that, notwithstanding the superior quantity and quality of the produce, the invention has only benefitted those who have held and licensed out the patent—not the refiners who have used it: several of the largest vacuum refineries have failed, or have ceased their operations. Indeed, I believe that, notwithstanding the aid of Government and the "artifices," as Dr. Ure has it, of the refiners, sugar has been transmitted into its refined state for a series of years *pro bono publico*. The expenses of a refinery are so enormous and various, that it requires the greatest discrimination

in the choice and purchase of the raw material, united to the most matured and sound judgment in the arrangement of the complicated details of the process, to insure the mere common interest upon the capital employed.

It would certainly be edifying addenda to Dr. Ure's Tables if he would, with the assistance of the Board of Trade, furnish the public with two additional tables, one containing all the expenses incurred by this series of experiments (from which every unusual extra might be safely deducted to lessen, as far as possible, its amount), and a final table of *results* in pounds, shillings, and pence, usually called a balance sheet, or profit and loss account. As sugar refining patents are now so frequent, and scientific men appear to be so deeply engaged in obtaining a kind of lapis-aurum in the shape of sugar loaves, the publication of the Government *profit sheet* would throw a practical light upon a very abstruse subject. Their processes have been conducted by an able and most indefatigable scientific man, whose results upon the main point would be very useful to capitalists overburdened with cash at this period.

I have examined with great attention the tables and report furnished under Dr. Ure's superintendence. The subject would have been rendered much clearer had the results of the whole series of operations been drawn out into one general table, comprehending the matter of the three several tables made from each experiment, amounting to eighteen separate calculations. For the purpose of rendering the subject more intelligible, I annex the following index to the tables, which, by some accident, have been printed out of their due order. The index refers to and connects the several calculations with their respective experiments. There are some errors in Dr. Ure's calculations materially affecting the final determination of the question—“What is the equitable amount of drawback which Government should allow upon export of refined sugar as an equivalent to the duty paid upon the raw?” I purpose, in a future communication, to notice those errors, and the general course pursued in these experiments.

## DR. URE ON SUGAR REFINING.

*General Index to his Tables, &c., London Journal of Arts, &c., Vol. IV., Conjoined Series.*

Expt. and Table.	Process of Refinery.	Results, Drawbacks, &c.	Amount of Sales $\Phi$ Cust. Ho.	
I	205	1-11 } No. 25	313 } —	
II	315	1-42 } No. 27	314 } —	No. 27
III	316	1-14 } —	314 } —	—
IV	317	— 198 } No. 25	204 } —	The figures in the margin refer to the numbers and pages containing Dr. Ure's tables and results.
V	318	259 } —	201 } —	No. 25
VI	319	No. 26 261 } —	201 } —	
Vol. IV., Conjoined Series.				

Yours &amp;c.

J. L. S.

P.S.—Will the Editor be pleased to furnish, in a future number, a short notice of the quantity of Martinique or West India sugars which Mr. Brame Chevalier's process will refine per diem, and of the general expense of his apparatus? His invention proceeds upon a principle diametrically opposite to that of Howard's. Some data are wanted in order to make a comparative estimate of their respective merits.

## SCIENTIFIC ADJUDICATION.

## COURT OF KING'S BENCH.

*Before Lord Chief Justice Denman.*

*JONES v. RIPLEY AND OGLE, both of Leeds.*

This was an action for the infringement of a Patent right, granted 27th January, 1824, to the plaintiff, for a brushing machine for dressing woollen cloth. (See Jones's patent, vol. ix., First Series of London Journal of Arts, page 270.)

The case was conducted for the plaintiff by Sir James Scarlett, and for the defendants by Mr. F. Pollock. One witness only was examined to prove the infringement, when an exception was taken to the last clause of the specification, which appeared to involve a claim made in a former patent now expired. The Judge, therefore, ordered the plaintiff to be called, and a nonsuit was entered.

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### **New Patents**

#### **SE A L E D I N E N G L A N D,**

1834.

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**To Richard Walker, of Birmingham, in the county of Warwick, manufacturer, for his invention of an improvement in wadding for fire-arms.—Sealed 26th June—2 months for enrolment.**

**To Jonas Bateman, of Islington, in the county of Middlesex, cooper, for his invention of an apparatus or instrument for saving human life, or other purposes, in cases of shipwreck, or other disasters by water.—Sealed 30th June—6 months for enrolment.**

**To John Barton, of Providence-row, Finsbury, in the county of Middlesex, engineer, and Samuel and Joseph Nye, both of St. Andrew's-row, Southwark, in the county of Surrey, mechanics, for their invention of improvements in the construction and application of pumps and machinery for raising fluids and other purposes.—Sealed 1st July—6 months for enrolment.**

**To Thomas Martin Clerk, of Withby Bush, in the parish of Rudbaxton, in the county of Pembroke, for his invention of certain improvements in engines or machinery for cutting or preparing slates or other similar substances or materials for various useful purposes.—Sealed 3d July—2 months for enrolment.**

To James Hardy, of Wednesbury, in the county of Stafford, gentleman, for his invention of a certain improvement or certain improvements in the making or manufacturing of axle-trees for carriages.—Sealed 3d July—6 months for inrolment.

To Benjamin Hick, of Bolton-le-Moors, in the county palatine of Lancaster, engineer; Edward Evans, the elder, of Oldham, in the said county, coal-proprietor; and John Higgins, of Oldham, aforesaid, engineer; for their invention of certain improvements in the construction and adaptation of metallic packings for the pistons of steam and other engines, pumps, and other purposes to which the same may be applicable.—Sealed 4th July—6 months for inrolment.

To William Higgins, of Salford, in the county of Lancaster, machine maker, for certain improvements in machinery used for making twisted rovings and yarn of cotton, flax, silk, wool, and other fibrous substances.—Sealed 7th July—6 months for inrolment.

To John Gold, of Birmingham, in the county of Warwick, glass-cutter, for his invention of certain improvements in cutting, grinding, smoothing, polishing, or otherwise preparing glass decanters and certain other articles.—Sealed 7th July—6 months for inrolment.

To John Aston, of Birmingham, in the county of Warwick, button-maker, for his invention of an improvement in the manufacture or construction of buttons.—Sealed 10th July—6 months for inrolment.

To George Beadon, of Taunton, in the county of Somerset, lieutenant in the Royal Navy, for his invention of a machine or apparatus for preventing boats or other floating bodies from capsizing or overturning when oppressed by too much sail, and for easing off the ropes and sheets of different classes and descriptions of

vessels, parts of which machine or apparatus may be applied for other purposes.—Sealed 10th July—6 months for inrolment.

To Lemuel Wellman Wright, of Sloane-terrace, Chelsea, in the county of Middlesex, engineer, for his invention of certain improvements in machinery for cutting tobacco, and which machinery may be applicable to other useful purposes.—Sealed 10th July—6 months for inrolment.

To John Ramsbottom, of Todmorden, in the county of Lancaster, mechanic, and Richard Holt, of the same place, iron-founder, for their invention of certain improvements in the construction of power-looms for weaving cotton and other fibrous materials into cloth or other fabrics.—Sealed 12th July—6 months for inrolment.

To Peter Wright, of the city of Edinburgh, manufacturer, for his invention of an improved method of spinning, twisting, and twining cotton, flax, silk, wool, or any other suitable substances.—Sealed 17th July—6 months for inrolment.

To William Septimus Losh, of Walker, in the county of Northumberland, gentleman, for his invention of an improved method of bleaching certain animal fats, and certain animal, vegetable, and fish oils.—Sealed 17th July—6 months for inrolment.

To James Warne, of Union-street, in the borough of Southwark, pewterer and beer-engine manufacturer, for his invention of certain improvements in engines or machinery for raising, drawing, or forcing beer, ale, and other liquids or fluids.—Sealed 17th July—6 months for inrolment.

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## CELESTIAL PHENOMENA, FOR AUGUST, 1834.

D.	H.	M.	D.	H.	M.	
1		Clock before the ☽ 6 m.	17	30	50	
—		☽ passes the mer. 21 h. 29 m.	18	13	☽ in oppos. to the ☽	
21	4	in conj. with ε in Tauri, diff. of dec. 1. 47. S.			☽ in conj. with γ <sup>1</sup> Virginis, diff. of dec. 0. 34. N.	
22	♀	in conj. with σ in Leonis, diff. of dec. 0. 42. N.	15	19	☽ in conj. with the ☽ diff. of dec. 3. 45. N.	
4	13	52	☽ in inf. conj. with the ☽	20	11	Ecliptic oppo. or ☽ full moon.
14	16	☽ in conj. with the ☽ diff. of dec. 8. 43. S.			Clock before the ☽ 3 m. 13 s.	
18	35	Ecliptic conj. or ☽ new moon.	—		☽ passes the mer. 13 h. 24 m.	
5		Clock before the ☽ 5 m. 43 s.	21	5	25	♀ in the descending node.
—		☽ passes the mer. 0 h. 23 m.	9	52	♀ in conj. with ☽ diff. of dec. 2. 29. N.	
18	38	☽ greatest Hel. Lat. S.	22	4	♂ in conj. with ε in Tauri, diff. of dec. 0. 40. S.	
7	10	40	♀ in conj. with the ☽ diff. of dec. 4. 41. S.	11	11	☽ greatest elong. 18. 22. W.
10		☽ in Perigee.	12	55	♀'s second sat. will im.	
8	10	37	☽ in conj. with the ☽ diff. of dec. 2. 58. S.	14	20	♀'s first sat. will im.
21	♀	in conj. with γ in Virginis, diff. of dec. 0. 2. S.	15	13	♀'s second sat. will em.	
10		Clock before the ☽ 5 m. 7 s.	23	5	☽ in Apogee.	
—		☽ passes the mer. 4h. 48 m.	24		Mer. R. A. 8 h. 59 m. dec. 16. 53. N.	
11	10	13	☽ in ☐ or first quarter.	—	Ven. R. A. 12 h. 45 m. dec. 5. 2. N.	
11	18	14	♂ in conj. with ♀ diff. of dec. 0. 7. N.	—	Mars R. A. 4 h. 58 m. dec. 22. 10. N.	
12		Mer. R. A. 8 h. 36 m. dec. 14. 57. N.	—		Vesta R. A. 4 h. 0 m. dec. 13. 20. N.	
—		Ven. R. A. 11 h. 55 m. dec. 1. 7. N.	—		Juno R. A. 19 h. 4 m. dec. 8. 28. S.	
—		Mars R. A. 4 h. 26 m. dec 20. 58. N.	—		Pallas R. A. 12 h. 17 m. dec. 8. 52. N.	
—		Vesta R. A. 3 h. 48 m. dec. 13. 1. N.	—		Ceres R. A. 12h. 22 m. dec. 5. 40. N.	
—		Juno R. A. 10 h. 10 m. dec. 7. 7. S.	—		Jup. R. A. 4 h. 31 m. dec. 21. 4. N.	
—		Pallas R. A. 11 h. 58 m. dec. 9. 55. N.	—		Sat. R. A. 12 h. 35 m. dec. 1. 23. S.	
—		Ceres R. A. 12 h. 4 m. dec. 8. 2. N.	—		Georg. R. A. 21 h. 47 m. dec. 14. 9. S.	
—		Jup. R. A. 4 h. 25 m. dec. 20. 50. N.	—		☽ passes the mer. 22 h. 51 m.	
—		Sat. R. A. 12 h. 31 m. dec. 0. 50. S.	—		♀ passes the mer. 2 h. 36 m.	
—		Georg. R. A. 21 h. 49 m. dec. 13. 59. S.	—		♂ passes the mer. 18 h. 48 m.	
—		☽ passes the mer. 23 h. 10 m.	18	4	♀ passes the mer. 18 h. 20 m.	
—		♀ passes the mer. 2 h. 33 m.	25		☽ in the ascending node.	
—		♂ passes the mer. 19 h. 3 m.	—		Clock before the ☽ 1m. 5s.	
—		♀ passes the mer. 19 h. 0 m.	—		☽ passes the mer. 16 h. 50 m.	
14	17	16	♀ stationary.	26	23	46
15		Clock before the ☽ 4m. 17s.	27	11	50	
—		☽ passes the mer. 9h. 17 m.	—		☽ in ☐ or last quarter.	
12	27	♀'s first sat. will im.	28	3	58	
—		35 ♀'s second sat. will em.	29	7	25	
21		♀ in conj. with γ in Virginis.	15	32	☽ in Perihelion.	
			31	15	♀ in conj. with α Virginis, diff. of dec. 1. 26. S.	

## METEOROLOGICAL JOURNAL,

FOR JUNE AND JULY, 1834.

1834.	Thermo.		Barometer.		Rain in inches.	1834.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	Hig.	Low.			Hig.	Low.	Hig.	Low.	
June						July					
26	75	50	30,14	30,12		12	81	57	29,98	29,90	
27	74	49	30,10	30,06	,075	13	72	50	29,88	29,85	
28	79	52	30,11	30,04	,025	14	76	53	29,97	29,90	
29	80	54	30,22	30,17		15	81	50	30,13	30,05	
30	81	51	30,29	30,26		16	85	53	30,18	Staty.	
July						17	87	56	30,16	30,09	
1	69	47	30,23	30,11		18	75	60	29,84	29,79	
2	74	49	30,04	30,00		19	59	50	29,61	29,50	,975
3	79	53	30,03	30,00		20	65	49	29,58	29,43	,6
4	81	54	29,99	Staty.		21	65	51	29,72	29,66	,375
5	82	51	29,97	29,93		22	71	53	29,91	29,81	,1
6	70	49	29,92	29,91	,325	23	76	51	29,97	29,94	,15
7	78	51	29,89	29,87	,2	24	77	53	29,96	Staty.	
8	74	54	29,96	29,89	,025	25	78	54	29,96	29,95	
9	69	49	30,03	30,01	,025						
10	73	51	29,98	29,93							
11	79	56	29,99	29,91							

The wheat, which every where promises abundance, has in some places been cut; and no doubt, but for the rain since the 17th, the harvest would ere this have generally commenced.

The thermometer rose on the 17th to a height not attained since 28th June, 1826, at which time it was 89.

Edmonton.

CHARLES HENRY ADAMS.

Latitude 51° 37' 32" N.

Longitude 3° 51' West of Greenwich.

angular grooves in the face of the bed-stone, which, acting together, it is considered will break the corn more effectually than the form of grooves usually cut in the faces of mill-stones.

In order to fill up any small holes which may and often do occur in the faces of these stones, it is proposed to break up portions of French burr stone into small pieces, and also to pulverise some portions of these burr stones, and with them to mix a quantity of alum. These materials being placed in a ladle over a fire, will, by the alum melting, become a sort of fluid ; and being applied as a cement to the holes in the faces of the stones, those holes will be effectually filled up, and the surfaces at those parts made even.

The new mode of hanging and adjusting the upper stone does not appear to be very clearly described in the specification ; there seems to be a cross-bar, through which the spindle passes, with a screw on the spindle, by which the stone may be raised or lowered at pleasure. The contrivance appears altogether to be designed for portable mills, or for small mills for grinding and preparing flour for private families.—[*Intellect in the Inrolment Office, January, 1830.*]

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*To WILLIAM DODGSON, of Lower Shadwell, in the county of Middlesex, pump and engine maker, for his invention of certain improvements in ships' scuppers, and which may be applied to other purposes.—[Sealed 17th November, 1829.]*

THE scuppers or apertures on shipboard, by which water is discharged, are proposed by the Patentee to be furnished with valves or flaps opening outward, in order that the

water may run off freely from the interior of the vessel, but that no water may be allowed to enter through the same aperture.

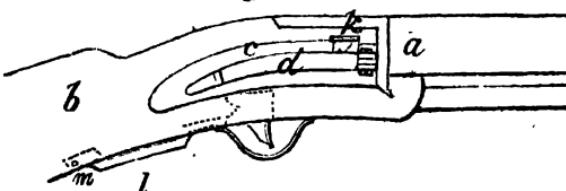
When the scupper hole is in a horizontal position, the flap or valve which closes it must be furnished with a counterpoise or loggerhead behind its hinge joint, for the purpose of balancing its weight and keeping the flap up against the hole; but when the flap hangs perpendicularly, its own weight will keep it to its seat.—[*Enrolled in the Inrolment Office, May, 1830.*]

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*To DAVID LAWRENCE, of Stroud, and JOHN CRUNDWELL, of Ashford, both in the county of Kent, gun-makers, for certain improvements in apparatus to be applied to fowling-pieces and other fire-arms in place of locks.—[Sealed 15th September, 1829.]*

WE should call this invention a gun-lock of a peculiar construction, certainly not a substitute for a lock, because without a gun-lock the improved apparatus would be useless.

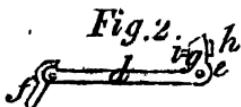
*Fig. 1*



The improved contrivance applies to those kind of fowling-pieces or other fire-arms which are primed by detonating compositions, and discharged by percussion. The detonating composition may be placed in a cap, as usual, or be employed in the form of small balls; a very

slight variation in the construction of the apparatus rendering either mode applicable.

Fig. 1, shows a portion of a fowling-piece, with the improvement adapted thereto: *a*, represents the breech part of the barrel; *b*, the butt; *c*, the lock plate; *d*, a lever which forms the principal feature of the improvement.



The lever is shown detached in a horizontal view at fig. 2; it is attached to the lock plate by a hinge joint at *e*, and is opened by a thumb piece *f*, the part *g*, being designed to receive the detonating composition.

The internal construction of the works of the lock forms no part of the present improvement: the kind of lock employed is one in which the stroke is given by the smart thrust forward of a plunger against the breech at the end of the barrel where the touch-hole is situate, and at the mouth of which touch-hole the detonating composition must be exploded. This blow may be produced by various contrivances, which are well known as applicable to gun-locks.

In fig. 2, the piece *h*, *i*, inserted at *g*, represents the nipple, which is perforated longitudinally. The broad end *h*, is intended to lie against the orifice of the touch-hole, and the small cylindrical part *i*, to receive upon it the detonating cap. In order to prime the gun, the lever *d*, must be thrown open from the lock plate by turning upon its hinge joint; and when the detonating cap has been placed upon the nipple *i*, the lever is then to be closed, as at fig. 1, which will bring the part *h*, up against the touch-hole, as described. The trigger being then drawn in the ordinary way, the plunger of the lock will be let off; and by striking with a smart blow against the detonating cap

placed upon the nipple at *i*, the explosion will take place ; and the fire passing through the nipple, will proceed through the touch-hole into the barrel, and discharge the contents of the gun.

In the event of small detonating balls being employed instead of detonating caps, those balls may be placed in a small magazine or box shown at *k*, in fig. 1, affixed to the lock plate. This box is conical within ; and through a small hole at its under part one priming ball is enabled to descend whenever the lever *d*, is thrown open. To receive this priming ball a recess is made in the part *g*, of the lever ; which recess, when the lever stands open, is brought immediately under the delivering hole of the magazine. Hence on the opening of the lever *d*, a priming ball descends into the recess, and on the closing of the lever the longitudinal aperture is brought into coincidence with the touch hole. A sliding pin or piston must in this instance be introduced in place of the nipple at *i*, against which the blow of the plunger striking when the trigger is drawn, the ball will be exploded and the contents of the barrel fired. This piston, after each discharge, may be forced outward again by a small helical spring embracing it.

At the outer end of the lever *d*, the thumb piece *f*, has a joint, and also a tooth or catch intended to bear against a stop when closed, for the purpose of keeping the lever fast against the lock plate.

In order to prevent the gun being discharged accidentally, a contrivance is applied which bolts the trigger. This contrivance is shown at *l*, in fig. 1 ; it is a bent lever mounted upon a fulcrum pin at *m*, the reverse end of which lever acts as a bolt against the trigger. When the gun is brought to the shoulder for firing, the hand, as it approaches the tail of the trigger, presses against the lever *l*, and forces it upwards, which brings the bolt end of

the lever opposite a notch in the trigger, and thereby sets the trigger free; but without thus acting upon the lever *l*, the trigger would remain locked, and the gun could not be discharged.]—*Enrolled in the Enrollment Office, March, 1830.*]

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*To JOSEPH GIBBS, of Grayford Mills, in the county of Kent, timber merchant, for his invention of improvements in machinery for cutting marble, wood, and other substances.—[Sealed 12th November, 1829.]*

THIS is a machine in which ornamental devices in bas-relief, are to be wrought in wood, metal, stone, or other material from patterns or models; the operating part of the machine working in the manner of a vertical drill.

There are two flat tables fixed one above the other, and perfectly parallel to each other; upon the lower of which tables, the piece of wood or other material intended to be cut or carved in bas-relief is to be made fast; and immediately over this, on the upper table, the bas-relief pattern or model of the device is to be securely fixed.

The working drill is mounted in a swinging frame, and is driven by a band from a rigger, passed round a pulley upon the drill; and in the same swinging frame, immediately above, and precisely coincident with the axis of the drill, a smooth-pointed pin is fixed, the pin and the drill being so adjusted in the frame, as to their distance apart, that when the point of the pin above touches any part of the surface of the bas-relief, pattern, or model, the point of the drill below shall touch a corresponding part of the material to be carved or wrought.

The frame carrying the drill and the guide point is mounted upon a vertical shaft, fixed to a standard, or to the side of the apartment or building in which the work is

to be performed. The frame is enabled to turn or swing round horizontally upon its shaft, so that the point may be passed over the surface of the model; and it is also enabled to advance or recede by adjusting screws. Besides swinging round horizontally, the frame carrying the point and drill is enabled to slide up and down vertically, in order that the guide point and the drill may together, that is simultaneously, be raised up, the one from the surface of the model, and the other from the work; which is to be done by a lever, or treadles and rod, connected to the frame, over which the attendant workman has command.

In this way the guiding point is intended to be shifted to every part of the surface of the model in succession, and in so shifting, to bring at the same time the operating drill below, over a corresponding part of the piece of wood, metal, stone, or other material about to be wrought to a similar pattern or device.

According to the subject to be cut or carved, so must drills, with different sorts of points or heads, be employed and shifted, as occasion may require, from the drill stock, and others applied in their stead. Some of the drills are to have rose heads, others spear heads, and various forms suited to the excavation intended to be made in the material under operation.

Let it now be supposed that the guide point, by means of the swinging frame, is brought over the model, and that the drill is made to revolve by means of the strap and pulley, as before described, the point or head of the drill will, as it revolves, penetrate into the surface of the material fixed on the lower table, until the guide point above has descended to the surface of the model fixed on the upper table, then the drill will be prevented from cutting further, and the frame must be raised by the workman bearing upon the

lever. The point being then brought over another part of the model, the drill will be allowed, as before, in like manner to cut away the surface of the wood, metal, stone, or other material. The guide point being thus shifted from place to place, the drill will, by a succession of operations, cut or carve out the complete copy of the model over which the guide point has been conducted.

Thus copies of ornamental scrolls, foliage, and devices, of a variety of kinds, principally for decorating buildings, may be cut or carved in wood, metal, stone, and other materials from models, by the different sorts of drills, guided by the parallel guide point, in a machine of the sort described; and which operation may be performed with considerable expedition and cheapness.

There are several sheets of elaborate drawings accompanying the specification, exhibiting this machine in different positions and in detached parts, which we cannot, with any convenience, compress into our present limits: nor do we consider it at all necessary to exhibit these figures, as the general features and operation of the machine may be easily understood from what has been said; and it does not appear that any novelties in the mechanism are claimed, but only the arrangement and adaptation of the whole to the purpose described.—[*Enrolled in the Enrollment Office, May, 1830.*]

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To WILLIAM GOOCH, of Mount-street, Berkley-square, in the county of Middlesex, for his having invented certain improvements on baths of different descriptions, which improvements are applicable to other purposes.—  
[Sealed 7th November, 1829.]

THE invention which forms the subject of this patent, consists merely in combining in one apparatus several well

known contrivances which have been heretofore commonly used separately; as a portable shower bath, a vapour bath, and a slipper bath. These are proposed to be adapted together so as to constitute one apparatus, in which all these several operations may be performed in succession without removing the patient.

Supposing one of the upright shower bath closets resembling a sentry box be employed, in the upper part of which the vessels and other apparatus are suspended in the ordinary way for producing a shower. In the lower part of this closet, that is, upon its floor, a pot or other vessel is to be placed containing aromatic herbs or medicinal materials, which pot is covered with a lid pierced full of holes like a colander. A pipe from a small boiler, on the ordinary fire of a bedchamber, is to be passed through the side of the closet into the pot containing the medicinal materials, for the purpose of conducting steam into the vessel, which steam, acting upon the herbs, will cause an aromatic vapour to be evolved, and to be passed upwards through the perforations in the lid of the vessel into the closet.

The person intending to be operated upon by the vapour bath, is to be enclosed within the closet, covered with a cloth hood, as usual, having an aperture in the top to pass the head through; and in this way the steam atmosphere which rises from the vessel below will be made to act upon the body, or upon any part of the body, without affecting the respiration.

When this sudorific operation has been continued a sufficient length of time, the steam may be shut off, and the patient may receive a shower bath without quitting the closet.

Another arrangement of the invention is designed for giving the vapour, the shower, and also immersion to a patient, by one apparatus.

A vessel generally known as a slipper bath is to be employed, having a partially perforated bottom, through which, from a chamber below the bath, the steam and aromatic vapour from a pot or vessel, as above described, is to be allowed to pass upward to the patient reclining in the slipper and covered by a hood of cloth. When the sudatory has operated as long as may be thought necessary, a shower of cold water may be let fall upon the patient from a suitable apparatus above, and after this the slipper may be filled with water so as to immerse the patient.

The claim of invention is the combination of these contrivances in one apparatus, and not the contrivances themselves taken separately.—[*Enrolled in the Enrollment Office, May, 1830.*]

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*To HAYWARD TYLER, of Warwick-lane, in the city of London, brass-founder (being one of the people called Quakers), for certain improvements in the construction of water-closets.—[Sealed 23d September, 1829.]*

IN this improved construction of water-closets it is not proposed to deviate materially from the general arrangement of the ordinary parts of a water-closet, but to adapt certain appendages for the purpose of forming air-tight valves, which shall prevent the passage of offensive effluvia up the discharge pipe.

It will not be necessary to describe all the parts of the mechanism of a water-closet, as they are sufficiently known: we shall, therefore, merely point out the proposed improvements.

Immediately under the discharging aperture of the pan or basin of the water-closet a horizontal sliding valve is intro-

duced, which closes the aperture perfectly air-tight when the closet is not in use, and which is to be opened by a lever when the soil is required to be discharged.

This valve is formed by a circular plate or disc of metal, mounted upon a pivot or centre pin, the plate being packed so as to be perfectly air-tight, but yet allowed to turn freely in a horizontal direction.

The disc or plate of metal forming the valve has an eccentric circular hole through it, in such a situation that as the disc is turned round upon its pivot, this hole may be brought into coincidence with the discharging aperture at bottom of the basin. When that is the case, the soil and water will be allowed to pass down into the discharge pipe; but when the disc is so turned that the solid part of the metal is immediately under, and intercepts the discharging aperture of the basin, then the passage is so completely closed that neither water can pass down nor effluvia up; the packing in which the disc or plate slides being sufficiently close to constitute an air-tight valve.

It will readily be perceived that this disc may be turned round by a variety of mechanical contrivances: that which the Patentee prefers is a segment rack fixed to the axle of the disc, and acted upon by a pinion connected to a lever, which is worked by a handle rising above the seat.

The other contrivance applies to a dish valve; that is, a dish or hollow vessel hung upon a hinge joint under the discharging aperture of the basin, which is intended to contain water sufficient to form a water valve that is to close the aperture of the basin, and by means of the water to prevent the offensive effluvia rising from the discharge pipe.

But as it may sometimes happen that the water will escape from the dish, and thereby leave the communication open, it is proposed, as the improvement, that the edge of

the dish all round shall have a rim of leather fitting exactly against the lower edge of the basin, and being kept up thereto by a balance weight, the valve will be tight, and the effluvia be prevented from passing, even though the water may have discharged itself from the dish.—[*Inrolled in the Inrolment Office, March, 1830.*]

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*To THOMAS HALL ROLFE, of Cheapside, in the city of London, musical instrument maker, for his new invented improvement or improvements upon the self-acting piano-forte.—[Sealed 11th August, 1829.]*

THE specification of this patent would fill a volume: its extraordinary length, therefore, obliges us to give only the leading features of the invention.

These improvements apply to a self-acting piano-forte; that is, an instrument in which the keys are worked by a revolving barrel, the periphery of the barrel being studded with wire staples as tappets, which, as it revolves, depress the keys in succession, and cause the hammers to strike the strings, and give out the tones as when played upon by hand.

The objections which are stated to have presented themselves in the construction and performance of the self-playing piano-fortes heretofore made are the difficulty of shifting the barrel in order to change the tunes; the labour which the barrel has to perform in producing the forte and piano gradations of tone; and the monotonous sounds resulting from the too sudden action of the dampers.

To remedy these defects certain novel contrivances are proposed to be adapted to the instrument, which are

described under three several heads: first, a simple and easy mode of shifting or sliding the barrel laterally for the purpose of changing the tunes, that is, bringing other sets of staples or tappets upon the barrel to act upon the keys; secondly, an improved method of producing the forte and piano tones by an auxiliary barrel and levers; and, thirdly, the adaptation of an additional set of dampers applicable to the self-acting part of the instrument, and independent of those dampers which are connected to the keys worked by the fingers.

Under the first head the revolving barrel is described as being pressed toward one side of the frame or case by a powerful spring coiled round its axle, which spring keeps the barrel up to a certain bearing. This bearing, however, is capable of being moved by means of a wedge or inclined plane situate behind it, by which inclined plane the barrel may be forced back, the spring giving way. Hence it will be perceived that the position of the wedge or inclined plane will govern the situation of the barrel, and that by sliding the wedge which moves the barrel, the tappets, for any tune desired, may be brought into operation.

On the upper edge of the inclined plane or wedge a rack is formed, which is acted upon by a toothed sector, the sector being moved by a pinion and train of wheels above. Connected to this train of wheels there is an index or pointer to be turned upon a dial plate on the outside of the case; which index, on being brought to point to any tune named in the dial plate, causes the toothed gear to slide the wedge so as to bring the barrel into the proper position for acting upon the keys as the barrel goes round to produce the desired tune.

In producing the forte and piano tones upon the instrument heretofore, high staples inserted into the periphery

of the barrel have been employed ; but these high staples, having to bear very considerable weight and pressure, impeded the operation of the instrument. An apparatus is therefore proposed, under the second head of this invention, which shall produce the effect with greater facility.

An auxiliary shaft, connected by wheel work with the going fusee or spring barrel, carries certain tappets, intended as they go round to act upon sliders which communicate with levers that raise or depress the parts called the forte and the piano keys, for the purpose of opening or closing those keys at such particular parts of the tune as may be required to be expressed either with particular force or peculiar softness.

The third head of the invention applies to an additional set of dampers connected to those keys, which are worked by the rotation of the tappet barrel, and having no connexion with the dampers of those keys which are played by the fingers.

It is stated that when the dampers are allowed to strike the strings suddenly, as in the self-playing pianos heretofore made, the notes finish with so much abruptness as to destroy the desired effect of expression and feeling in the music. To remedy this defect the Patentee attaches to the hinder part of each damper a weight, in order that as the damper rises in returning to stop the vibration of the string after every note, the gravity of the weight may partially retard its approach toward the string, and thereby cause the vibration to be gradually discontinued.—[*Enrolled in the Petty Bag Office, February, 1830.*]

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*To DANIEL MACDOUGALL, of Edinburgh, horticulturist,  
for his invention of certain improvements on, or additions  
to syringes, applicable to garden and other purposes.—  
[Sealed 10th November, 1829.]*

THE subject of this patent is a syringe, intended to be employed for washing the branches of shrubs in order to remove insects. It consists in attaching to the extremity of the syringe a bent tube with a perforated cap, by which water may be forced in the form of a shower upwards or sideways, for the purpose of washing the under parts of the branches and recesses between them, to which access might by any other means be difficult.



The above fig. represents a longitudinal section of the syringe, the cylindrical barrel and the piston of which are of the ordinary form and construction: *a*, is a bent tube attached to the end of the barrel, having a perforated cap-plate *b*, with a small valve in the middle opening outwards.

By introducing this end of the tube with the valve into a vessel of water, and drawing the piston back, the barrel will become filled with water; and then, by forcing the piston forward, the water will be expelled through the small holes in the perforated cap in the form of a shower, at an oblique angle to the direction of the piston.

The claim of invention is the bent tube at the end, and the introduction of the valve in the cap or rose head.—  
[Inrolled in the Inrolment Office, May, 1830.]

*To JOHN STEWART, of George-street, Euston-square, in the county of Middlesex, piano-forte maker, for his having invented certain improvements on piano-fortes.—*  
 [Sealed 2d November, 1829.]

THE improvement proposed under this patent is a slight variation in the form of some of the rods or levers which constitute what is called the action part of a piano-forte, and the introduction of a horizontal rail, upon which the fulcrum joints of such levers are intended to be supported. The advantages proposed from this variation or peculiarity of construction, are not pointed out in the specification, and are by no means obvious from an inspection of the drawing; and as it would be impossible to give a just idea of the plan without exhibiting a section of the interior of the piano-forte with all its working parts, we trust that this notice of the invention will, in this instance, be considered sufficient.—[*Enrolled in the Inrolment Office, January, 1830.*] 

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*To FRANCIS NAISH, of Stoneaston, near Wells, in the county of Somerset, gentleman, for his having invented or found out certain improvements in the manufacture or application of silks, mixed or combined with other articles.*  
 [Sealed 2d November, 1829.]

THE object of the Patentee is to combine soft waste silk with cotton or wool, or other fibrous material, for the purpose of manufacturing it into articles of wearing apparel and other fabrics.

The refuse or floss silk rejected by the spinner is to be cut into short lengths by any convenient hand implement,

and having been picked and sorted as to its colours, it is then to be chopped into short staple by a chopping machine of a particular construction.

After this the silk is to be passed through another machine called a breaker, and then to be mixed with a suitable quantity of cotton or wool, or other fibrous material, in the machine called a tucker or devil, usually employed for opening or separating the fibres of cotton and wool.

When the silk and other materials have been thus mixed, they are ready to be operated upon by the scribbling and carding engine, and then by the slubbing billy and spinning jenny or throstle in the ordinary way of preparing yarns for the weaver.

The only feature of novelty, however, which the Patentee proposes to claim under this patent, is the machine for chopping the silk into short staples, and that for breaking it afterward, both of which are so very imperfectly exhibited, in the rudely sketched perspective views which accompany the specification, that we are utterly unable to describe them.

The apparatus called the chopping machine has a straight knife, intended to be moved up and down, as we suppose, with a quick vibratory action; but the means of actuating it is not shown, neither is there any bed or bench represented upon which the material is to pass under the knife, or any thing against which the ~~knife~~ is to chop. The representation of the breaking machine is equally defective; we can simply understand that there is to be a revolving barrel with teeth or combs as it is expressed; but in what manner these rotary teeth are to be brought into operation upon the material we are unable to explain.—

[*Inrolled in the Petty Bag Office, January, 1830.*]

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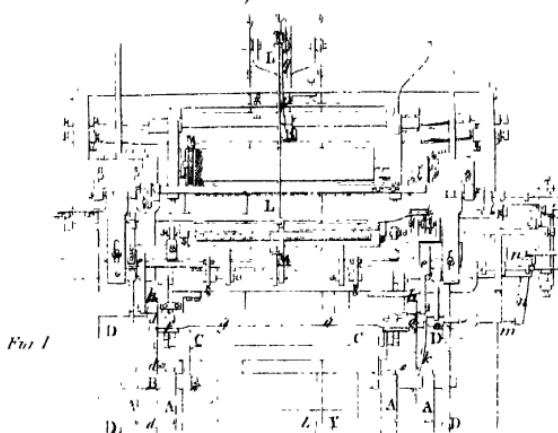


FIG. 1



FIG. 3

a' a

FIG. 4

a' a

b' b

c' c

d' d

e' e

f' f

g' g

h' h

i' i

j' j

k' k

l' l

m' m

n' n

o' o

p' p

q' q

r' r

s' s

t' t

u' u

v' v

w' w

x' x

y' y

z' z

a' a

b' b

c' c

d' d

e' e

f' f

g' g

h' h

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k' k

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v' v

w' w

x' x

y' y

z' z

a' a

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c' c

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e' e

f' f

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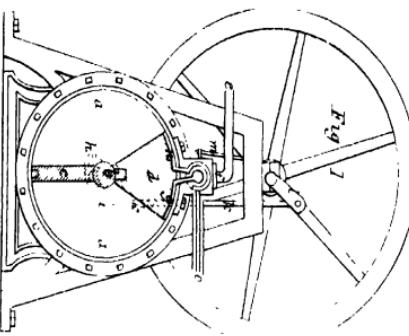
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apparatus*

*Hydrostatic System Engine*

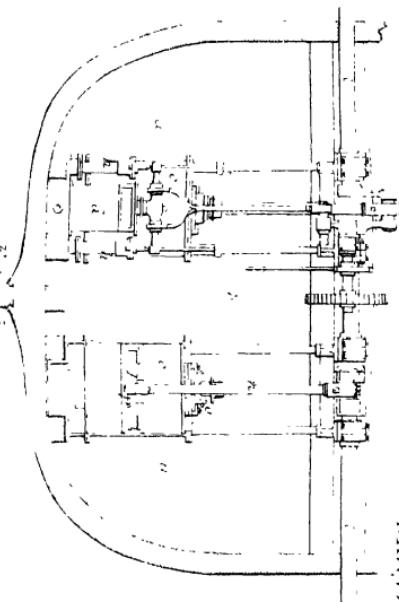
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*Hydrostatic System*

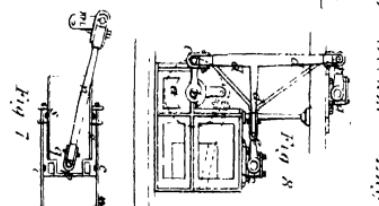
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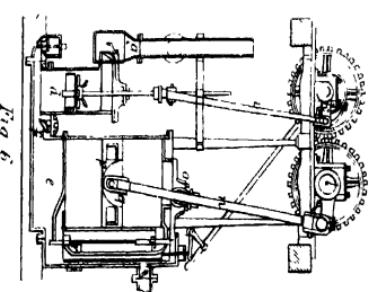
*Fig. 1*



*Fig. 2*



*Fig. 3*

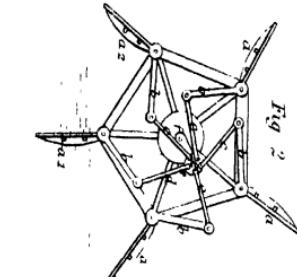


*Fig. 4*

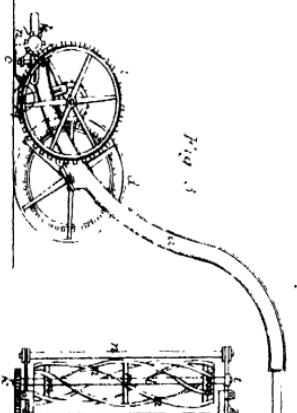
*Scenic View  
Machinery*

*Scenic View  
Machinery*

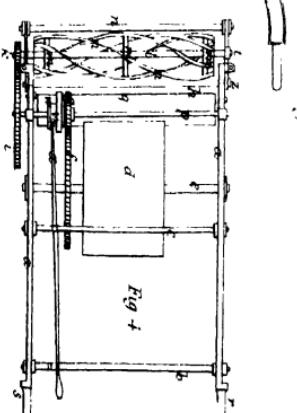
*Scenic View  
Machinery*



*Fig. 5*



*Fig. 6*



*Fig. 7*



The mode of constructing these boilers is shewn in Plate VI. Fig. 11, is a perspective view of one of the tubes or vessels detached; it is formed by a long plate of thin metal, the ends of which are to be braced or riveted together; the plate is then bent into the shape exhibited, and two iron bars *a*, with openings or eyes *b*, *b*, at their ends, inserted at the outer edges or sides of the vessel, to which the plates are secured by rivets, or screws. A flat tube is thus formed with an extended surface, but of small thickness, and it is kept from expanding or collapsing by studs placed within at certain distances apart, and secured by screws or bolts, with rivets passed through both surfaces of the plates.

The enlarged or cylindrical ends of the tubes constitute chambers at bottom and top, for the passage of the water and steam, and when a series of these vessels are combined, the water and steam flows freely from one vessel to another.

A series of these tubes are shewn connected and in section at fig. 13, with the other parts, constituting a complete boiler. There are four holes perforated through each of the tubes at *c*, *c*, *c*, *c*, with rings inserted in them, and these have small apertures for the purpose of letting out the water and steam into the longitudinal tubes *d*, *d*, *d*, *d*, fig. 13, when the whole of the boiler is put together and in action.

The detached fig. 12, shews a ring *d*, with a bolt and nut *e*; one of these rings *d*, is placed against such of the apertures *c*, between the vertical tubes or vessels, as shewn in fig. 13, covering the apertures *c*, *c*, and fitting very closely with packing, and a bolt being passed through the whole series and screwed up tightly by means of the nuts *e*, *e*, the whole series of tubes are combined

and free ways are formed for the passage of the water and steam from one vessel to another.

End tubes  $f, f$ , fig. 13, are constructed and united in a similar manner, and they as well as the tubes  $d$ , all lead into a flat chamber  $g$ , at top, in which the steam evolved from the boiler proceeds through  $h, h$ , and is passed off by a pipe to the indication part of the engine. The water for supplying the boiler is injected at the lower pipe  $i, i$ , combined and secured in a similar manner to that above described, and from thence it passes into the other vessels. The bars of the furnace  $k, k$ , rest upon the lower pipes, and the flame and heated vapour, from the ignited fuel ascending, acts against the surfaces of the tubes, and causes the steam to be generated copiously ; the smoke passing off into the chimney, by channels  $l, l$ , made through the horizontal chamber  $g$ .—[*Enrolled in the Petty Bag Office, January, 1828.*]

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*To GOLDSWORTHY GURNEY, late of Argyle Street, Hanover Square, but now of Albany Road, Regent's Park, Mary-le-bone, in the county of Middlesex, Surgeon, for his invention of certain improvements in loco-motive engines, and other applications connected therewith.—[Sealed 11th October, 1827.]*

THE invention which constitutes the subject of this Patent, was intended to perfect the steam coach, which acquired so much notoriety some time back.

It is known to our readers, that though all the world appeared to be satisfied that the great desideratum, a steam coach, running upon ordinary roads, was at length

achieved, we entertained considerable doubts upon that subject; and therefore anxious to allow the inventor every possible chance of success, by giving him time to arrange such modifications as experience might prove to be necessary, we have withheld our report of this patent, much longer than we should otherwise have done; still, however we are in the same state of doubt, for by nothing that we have yet seen are we enabled to say, that the project of driving a coach upon an ordinary road, by means of steam, is yet proved to be *practicable*.

The present improvements are represented to be, not new in principle, but arrangements of the parts necessary to a steam coach, upon a more eligible plan than has been heretofore adopted; the greater part of the details of the machinery, are described in the specifications of former patents granted to the same gentleman, see our first Series, Vol. XIII. pages 74 and 77.

The general construction and arrangement of the parts of the steam coach, according to this last improvement is shewn in plate VII, at fig. 4, which is a section taken longitudinally through the coach, and through the boots and other parts, which enclose the machinery; *a*, is the furnace and boiler, which is situate in the hind boot. The boiler consists of a series of pipes or tubes of small capacity, which are bent and twisted in various directions, and enclose the fire within their coils. These tubes being filled with water, cause a quantity of steam to be generated at a high pressure, which is conducted to the eduction apertures of two steam engines *b*; the actions of the pistons of which drive the carriage.

The pipes which constitute the boiler, discharge the steam and heated water into the horizontal cylindrical tubes *c*, *c*, and thence to the vertical tubes *d*, *d*, called separators; from these vertical tubes the steam passes

through a pipe *c*, to the engine, but the water which has been separated from the steam, runs again into the boiler by another channel; *f*, is a safety valve, provided at the top of the steam pipe to prevent explosion, and a throttle cock *g*, is placed near the conductor's seat in front to regulate the supply of steam, and consequently the speed of the carriage.

The tank for the water is placed under the carriage at *h*, and a small steam engine is situate at *i*, for the purpose of working the pump *k*, which supplies the boiler with water, and for actuating a rotatory fan *l*, which constitutes a blowing apparatus, for keeping up the fire in the furnace within the boiler; the current of air passing through the channel *m*, *m*, under the body of the coach into the furnace behind. The blower may be occasionally worked by a wheel when the fire is to be raised, or by an attachment to the running wheels; and a damper may be introduced to regulate the supply of wind.

The carriage is driven by means of the rods *n*, which are connected at one end to the piston rods of the engine *b*, and at the other end to the cranks *o*, *o*, on the axle of the hind wheels of the carriage. Thus the hind wheels being driven round, the carriage is impelled forward.

The conductor placed on the seat in front, has hold of the end of the lever *p*, by which he turns the pilot wheel *q*, in such direction as may be desired.

There is a spring *r*, connected by chains with the pilot wheel, which keeps the wheel (when the lever is not restrained by the conductor, as in turning) in a direct line of motion; and *s*, is a break or drag for stopping the rotation of the hind wheel, in going down hill. It is also proposed to connect propellers (we presume legs) to the crank rods *n*, if occasion should require.

The framing of the carriage and its body, may be made in various forms, and the details of the mechanism may be differently modified, but as nothing new is proposed in their construction or adaptation, and they are generally known as parts of all other loco-motive engines, it is unnecessary to go into a more minute description, as the patentee's claim of invention consists simply, in the arrangement of previously known contrivances as above described, and not in the parts themselves, which are either embraced in his former patents, or are already common property. —[*Enrolled in the Inrolment Office, April, 1828* ]

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### **Novel Inventions.**

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#### *Improved Gearing Chain.*

AN ingenious and useful construction of gearing chain for connecting cog wheels, has lately been invented by Mr. Oldham, engineer, of the Bank of Ireland, which we think highly deserving of the attention of machinists, as it is so extensively applicable to various kinds of machinery, such as carding engines; and indeed in almost every situation where a series of toothed wheels are required to be driven by one mover. It consists of a peculiarly constructed chain, with curved links, which when passed round a drum will serve as teeth, and act as a cog wheel to turn pinions, &c.; and when stretched out straight, or placed on a flat surface, will form an endless rack. It may also be passed over and under a series of rollers, pinions, &c. forming a carrying chain instead of the commonly constructed chains, in which spiked wheels are employed to take into the links.

In carding engines, and various other kinds of machinery

this improved chain will work with much better effect in connection with pinions, or wheels with common teeth, into which it is suited to gear, than the old chains, and without the possibility of slipping off, or riding over the points of spiked wheels ; having a broader surface of contact : and it is not at all liable to get out of order, being much stronger than the old linked chain used with spur pinions.

Plate VII. fig. 5, is a side view of a portion of the improved chain. Fig. 6, is a plan view of the same ; it is formed by crescent shaped plates constituting links, which are connected together: one and two plates alternately, or two and three, or more placed side by side ; the alternate links fitting in between each other at the joints, where they are connected by pins, or bolts passed through their eyes in lateral directions.

It will be seen that these curved links present on one surface of the chain simicircular hollows like a rack, for the teeth of the pinions to take into, and that the ends of the links, where the bolts or rivets are passed through are also formed semicircular, and the same size as the spaces or hollows of the links. These ends constitute teeth on the chain, and take into the spaces between the teeth of the pinions or wheels, and consequently drive them ; or the chain itself may be driven by such pinions or wheels in the same way as a rack.

It is obvious that such a chain may be passed in various directions over wheels, on its face, and over drums at its back, and may be used with certainty of effect : as whatever motion is given to the chain, will be communicated to all that is in gear with it.

Fig. 7, shews such a chain, supposed to be endless, carried over part of the periphery of a carding cylinder, and constituting a circular rack or toothed rim, which drives all the pinions connected to it ; the back of the

chain is conducted over a roller, and brought into gear with other pinions or wheels ; but as numerous illustrations might be produced of its applicability, it is unnecessary to say more, as its adaptation to a very wide range of machinery will at once be perceived by every practical mechanic.

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*Improved mode of coupling Machine Bands or Straps.*

MR. E. Budding, of Stroud, Gloucester, the recent Patentee of an ingenious machine for mowing lawns, has lately invented a new mode of uniting the ends of leather straps or bands, employed in driving machinery, which, from its simplicity and perfect security, will beyond all doubt, be adopted in every mill and manufactory where leather strapping is made use of, instead of lacing, thongs, rivets, or buckles.

In some mills where very long bands or straps are used, it is customary to secure the several pieces together by rivets, to form the whole length of strap ; and to attach the two extreme ends by lacings, so as to allow of adjustment. This mode of fastening is objectionable, as the hammering of the rivet, unless very carefully done, is liable to bruise and injure the leather, and frequently causes them to break at such parts when in use ; beside to make a secure joint, many rivets must be used, which is both expensive and troublesome.

Fastening straps with lacings or thongs is also objectionable, as they require many holes to be pierced through the straps, which weakens them, and when they require adjusting, a considerable time is lost in unlacing and relacing them again, to take up a hole ; during which time the machinery must stand still : and the lacings, in passing over the drums, are often cut, and very soon wear through ; thus producing delay and expence, and injury to the machinery. These disadvantages are so well known to all practical men, who have the superintendance of machinery, that we feel convinced any attempt to obviate them will be acceptable to our readers.

Mr. Budding's plan consists in employing studs, or metallic buttons, the shanks or stems of which are hollow sockets, having a female screw cut in them.

The stem or shank is as long as the thickness of the two pieces of strap when combined, and is made truly cylindrical, fitting the holes punched in the straps at the proper places of union. When the holes in the ends of the strap are brought together, the socket or shank of the stud is introduced through them, with the button or disk on the underside, and a screw with a large flat head is screwed tightly into the socket of the button, which compresses the leather between the button, and the screw head, as it becomes tightened up, and keeps the two pieces in close contact, producing a tight and secure joint; the strap being as pliable at the junction as at any other part.

Plate VII, fig. 8, to a view of the two pieces of strap fastened together, as seen on the upperside; fig. 9, is an edge view of the same; fig. 10, is a representation of the button or disk with its socket, rim, and the top screw separated from each other: fig. 11, a representation of them when put together.

When two pieces of strap are to be united, it is only necessary to punch the holes of the proper size, to suit the stem of the button intended to be used, and on bringing them together, the socket is to be introduced through them, and then the large headed screw introduced into the socket and screwed tight up.

It is obvious that this operation will take but little time, and a strap can be unfastened and a hole let out, or taken up and fastened again in a few seconds.

Straps of considerable strength and thickness, will require different sized buttons and stems, according to the rate at which are intended to work. They are generally used three together for securing one junction of the straps, for all ordinary purposes of machinery; but for a steam engine strap perhaps five may be required: more than five is seldom necessary, unless to an engine of very great power.

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No. XXXIV.

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[SECOND SERIES.]

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Recent Patents.

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*To THOMAS BAILEY, of Leicester, Frame-smith, for his having invented certain improvements in machinery for making lace.—[Sealed 5th August, 1829.]*

SPECIFICATION.

“ My improvements in machinery for making lace, consist, in certain combinations of parts, to be added to such machinery for making bobbin-net or twist lace, as is commonly known by the name of Lever’s single tier hand machinery; and by the aid of my additions the requisite movements are given to all the parts of such Lever’s machinery (in the proper order and succession to make lace) by motions derived from one handle or axis, which is turned round with a continuous circular, or rotatory motion, either by the hand of the workman, or by the mechanical power of mill work.

“ The structure and operation of Lever’s lace machinery being well known to frame smiths, and lace manufacturers, it is unnecessary to describe the same in this Specification ; but for the full explanation of my invention, I have hereunto annexed several figures of drawings (see Plate VIII), which represent a Lever’s machine with my improvements attached thereto, the parts constituting my improvements being distinguished by letters of reference and shading, and the parts in common use in Lever’s machinery being left in outline.

“ I shall describe certain alterations, additions, and arrangements which I have made in some of the parts of Lever’s lace machinery, in order that it may perform certain parts of its operations with more facility and safety than heretofore, and be thereby better adapted to be worked by means of my combination of machinery, with rotatory motion as aforesaid.

“ Fig. 1, is a front elevation of the whole machine ; fig. 2, a vertical transverse section of the whole machine ; fig. 3, an elevation at the back of the machine ; fig. 4, a horizontal plan of a part of my additional machinery detached ; and fig. 5, are detached views of other parts thereof. The same letters of reference are used to denote the same parts in all the figures. With respect to dimensions, it must be remarked, that my improvements are intended, for the most part, to be added to the existing Lever’s machine now in use, as hand machines ; by the term hand machine, I mean that the requisite movements of their parts are given by handles and treadles, which are moved alternately in due order and succession by the hands and feet of the workmen ; and my improvements being added, will convert such Lever’s machines into rotatory machines, for all the requisite movements will be derived from one revolving handle or axis ; it follows, then, that the exact dimensions of the several new parts, which are to be constructed according to my drawings, must be varied, when necessary, to suit the parts of the old Lever’s machine to which they are to be applied.

“ *Description of the new machinery.*—**A, A, A, A**, is the new framing, consisting of four strong iron bridges, situated side by side, parallel to each other in pairs; one pair at the right hand end of the machine, and the other pair at the left hand, and the bridges **A**, are fastened at their ends by screws to the sect rail, and the lower back rail of the old wood frame, as is shewn in the figures. These bridges support the bearings for the several rotative axes, and the wheel work; viz. **B**, is the horizontal axis to which the first motion is given by a handle or crank **C**, which the workman turns round with a continuous circular motion, when he stands in front of the machine, so that he can see the work it is making. On each end of the axis **B**, a spur wheel **D**, is fixed, in order, by the intermediate wheels **G, G**, and the pinions **F, F**, to turn the lower horizontal axis **E**, which extends all the length of the machine. The pinions **F**, are fixed, one on each end of the axis **E**, and the intermediate wheels **G, G**, turn on fixed stud pins, which are supported by the outermost bridges **A, A**.

“ By this wheel work the rotative motion that is given by the workman to the handle **C**, is transmitted to the horizontal axis **E**; but the pinions **F, F**, having only half as many teeth in each as the wheels **D, D**, the axis **E**, is caused to turn round twice for every turn that the workman gives to the crank handle **C**; **H, H**, are two pinions that are turned round by the pinions **F, F**, which have each the same number of teeth as the pinions **H, H**, and the latter are fixed on the extreme ends of two short axes, which are formed into cranks **a, a**, at the middle part of each axis, between the pairs of bridges **A, A**. On these cranks, two crank rods **b, d, b, d**, are jointed, and the other ends thereof are jointed to pins at the extremities of two short arms **e, e**, which are fixed to the front landing bar of the lace machine, in place of the two handles, by which the workman gives motion to that landing bar in the ordinary way of working Lever's machine by hand.

“ The incessant continuous circular motion, which is given to the cranks **a, a**, by the wheel work **H, F, G, D**, from the crank

handle *C*, is caused by the crank rod *b, d, b, d*, to move the front landing bar backwards and forwards, with a swinging motion about its main joint pins, in the same manner and for the same purpose as is usually done by the workman with his hands, viz. to cause the front and back landing bars, together with the front and back catch bars, and other parts which belong to those bars respectively, to mutually advance towards and recede from the vertical warp threads with equal swinging motions about their joint pins, in contrary directions to each other ; that is to say, when the front landing bar and front catch bar are moved away from the warp threads ; the back landing bar and back catch bar will also move away from the said threads at the same time, and vice versa ; the back bars will approach or return towards the warp threads at the same time as the front bars, such contrary swinging motions being produced by the usual drawing tackle levers and their goose neck rods and half jacks, whereby the front bars are connected to the back bars.

“ Such contrary swinging motions of the front and back landing bars is adapted, by the aid of their respective catch bars, to pass the bobbins and carriages through between the warp threads from the front combs unto the back combs, and then from the back combs into the front combs alternately, and by the aid of the racking motion of the guide bar between every such passage, causes the bobbin threads to twist round the warp threads.

“ The front and back catch bars are caused by their respective catch bar wheels to drop into the arches or notches of the carriages, at one time into the back notches, and the next time into the front notches thereof, according as the carriages are required to be drawn through into the front combs, or into the back combs ; and at the same time that one catch bar is so let fall by its catch bar wheel into the notches of the carriages, the opposite catch bar is lifted up clear out of the opposite notches of the carriages, by its own catch bar wheel, and so on, all the aforesaid parts operate in the well known manner of Lever’s machine, until the carriages have been passed three times

through, between the warp threads, and have thereby completed the operation of twisting the bobbin threads around the warp threads for a course, or half mesh.

“ To accomplish that twisting by my improvements, the crank handle *C*, must be turned by the workman one and a half turns, and the crank *a*, will then have made three turns, and will have passed the carriages three times through between the warp threads.

“ To effect the dividing of the carriages into two divisions, by the front and back dividers, for the purpose of crossing the bobbin threads, I cause the front and back landing bars to stop short of approaching so near towards each other, as they do at those times when all the carriages are required to pass in one row. I produce that stopping short of the said bars without any interruption of the continuous circular motion of the cranks *a, a*, by causing the crank rods *b d, b d*, to lengthen or extend themselves out to a greater length than usual at that period, when the carriages are to be divided into two divisions by the aid of the front or back dividers, but as soon as the division is effected, the said crank rods are caused to shorten again, and resume their usual length, so that they will not move the landing bars any further outwards from the warp threads than their accustomed distance, that is, as far as is necessary to draw the two divisions of the carriage quite into the front and back combs respectively, so as to be clear of the warp threads.

“ In order that the said crank rods *b, d, b, d*, may be capable of lengthening as aforesaid, I make each rod of two bars of metal *b*, and *d*, placed flat one upon the other, and united together by screws which pass through oblong slits in one bar, and are screwed fast into the other bar, so as to admit of one bar sliding freely upon the other bar, for a short distance, in the direction of their length. The joint at the lower end of each crank rod, by which it is united to its crank *a*, is formed at the end of the upper of the two bars, and the other joint at

the upper end of each crank rod, by which it is united to the short arms *e*, of the front landing bar, is formed at the end of the lower of the two bars ; *d, f*, is a stud fixed to the lower bar *d*, of each crank rod, by a shank which passes through a slit in the upper bar *b* ; the studs *f*, in the two crank bars, form a support to a horizontal sliding bar *g*, which rests upon them so as to be moveable in the direction of its length, through a short distance ; it is guided by screws which pass through slits in each end of it, and are screwed fast into the studs *f*.

“ At each end of the sliding bar *g*, is a permanent wedge, rising up from the upper or front side of the bar. When the bar *g*, is slid as far as it can go to the right hand, those wedges introduce themselves beneath the points of two gage screws *h*, which are screwed fast through the bends at the ends of the upper bars *b*, of the two crank rods *b, d*, and when the said wedges are so introduced beneath the points of the gage screws *h*, the crank rods are thereby contracted to their shortest length, and are as firmly retained at that length, as if they were each formed of one bar, or as if the two bars *b*, and *d*, of each rod were firmly screwed together, so as to have no sliding motion ; but when the sliding bar *g*, is moved or slid endways as far as it can go towards the left hand, then the prominent wedges at each end of it are carried away from beneath the points of the gage screws *h*, and permit the same to approach towards the studs *f*, whereby the rods are left at liberty to lengthen or extend themselves out as much as is permitted by the slits for the screws which unite the two bars *b*, and *d*, of each rod together.

“ The extension of the two rods is produced as soon as the wedges are withdrawn, because the machine springs, which are applied in the usual manner to overbalance the front and back landing bars, always draw the said bars away from the warp threads, so that they will not approach thereto, unless the crank rods *b, d*, oblige them to do so : consequently when

those crank rods (by the removal of the wedges at the ends of the sliding bar *g*,) are capable of lengthening out, they will not compel the landing bars to approach so near to each other as those bars must do, when the said wedges of the sliding bar *g*, are interposed beneath the points of the gage screws *h*, so as to retain the crank rods to their shortest length.

“ The sliding bar *g*, is drawn endways towards the right hand by a spring which always tends to bring the wedges at the ends of the bar *g*, beneath the gage screws *h*, and it is moved endways towards the left hand by the following means, when required to disengage the wedges:—

“ The right hand end of the sliding bar *g*, abuts endways against a piece *k*, figs. 1 and 4, which is moveable about a centre pin fixed into the upper bar *b*, of the right hand crank rod. The piece *k*, applies obliquely across the end of a horizontal lever *l*, which is situated against the inside of the upright legs of the wood frame, being poised by its middle upon an upright fixed pin, which is supported by some part of the fixed frame, and the opposite or back end of the lever *l*, which is connected by a short horizontal link *m*, with the back end of another similar horizontal lever *n*, which is situated at the outside of the upright legs of the wood frame, and is poised by its middle on an upright fixed pin, supported by that frame. The front end of the lever *n*, passes under the guide bar wheel, which is mounted on the upright spindle, as usual in Lever's machines, and the end of the lever *n*, is acted upon by two pins which are fixed into the guide bar wheels, or else into an extra wheel fixed on the upright spindle, so as to project downwards from the under surface thereof; the said parts *n*, *m*, *l*, *k*, and *g*, are suitably combined and arranged, in order that one or other of the said pins in the guide bar wheel shall, at the proper moment for dividing the carriages, come in contact with the front end of the lever *n*, and move the same away from the upright spindle of the wheels, (viz. towards the left hand) and that motion is transmitted by the link *m*, the lever *l*, and the piece *h*, to the

sliding bar *g*, so as to force the same endways towards the left hand, in opposition to its spring, and thereby the wedges at the end of the bar *g*, are removed from beneath the points of the gage screws *h*, in order to leave the crank rods at liberty to lengthen out, as before stated.

“ The wheels on the upright spindle are moved round one tooth, in the usual manner of Lever’s machines, by the driver, which acts in the teeth of their ratchet wheel, every time when the landing bars arrive at their greatest extension or departure from the warp threads, and it is then that the aforesaid wedges are removed, in the manner above described, from beneath the points of the gage screws *h*, in order to set the crank rods at liberty to lengthen out, which liberty being given to them, the front landing bar being overbalanced by its springs, will not begin to be moved towards the warp threads until the lengthening of the crank rods has taken place, and after that the crank rods, in their lengthened state, will draw down the front landing bar towards the warp thread, but not so near thereto as is done at other times, when the crank rods are returned at their shortest length, for the landing bars and catch bars will stop so much short of the distance to which they usually approach towards the warp thread, as will permit the edges of the front and back catch bar, to drop into the back and front notches of the carriages respectively, after those carriages are divided into two divisions by the action of the dividers, which takes place when the crank rods are lengthened as aforesaid, and at the instant when the landing bars are approached as near towards the warp threads as they can be approached while the crank rods remain so lengthened.

“ The dividing of the carriages into two divisions by the action of the dividers, is effected in the following manner:— When the machine is worked according to my improvements, and the same is a little different from the usual course of dividing in Lever’s hand machines, owing to the circumstance that my improvements do not cause the landing and catch bars to

approach so near to each other (or to the threads) at the time when the division is to be effected as at other times, when all the carriages are intended to be passed through in one division ; whereas in the usual manner of working Lever's machine by hand, the landing and catch bars are always put down towards each other to the same distance, and for dividing they are withdrawn again a little, in order to separate them from each other as much as is necessary to allow the edges of the two catch bars to drop into the front and back notches of the carriages respectively, after they are divided into two divisions ; according to my improvements, the dividing of the carriages is performed by one set of dividers acting at a time, viz. by the back dividers being chiefly operative when the carriages are to be divided in coming through out of the back combs into the front combs, and by the front dividers being chiefly operative when the carriages are to be divided in going through out of the front combs into the back combs.

“ For instance, to divide when all the carriages are in the back combs and coming forward, the carriages stop short before they arrive at the central position, in consequence of the lengthening of the crank rods, and at the same period the front points are descending by means of other parts of my improvement, to be hereafter described, in order to take up the work. In so descending, the front points lift up the back catch bar, by its connection with the arm which projects out from the front spindle bar in the usual manner ; and the edge of that catch bar is thereby raised out of the notches of the carriages, leaving them all at liberty ; and also in descending, the front points draw up the tie lever at the back of the machine in the usual manner, and that raises the tail of the back dividing bar, so as to bring that bar forwards, whereby the ends of the dividers overtake every other of the carriages, viz. those which are to become the front division, and push them forwards, without disturbing the intermediate carriages, which are to become the back division. When the carriages of the front division are

pushed so much forwards by the back dividers as to pass beyond the central position, until their front notches will be exactly beneath the edge of the front catch bar, that bar is let fall into the said notches by the usual means, viz. by the back dividing bar pushing the driver for the front catch bar, when so pushed forwards as to turn the said wheel round far enough to let the catch bar drop.

“ By the time that the division is thus effected, and the front division of carriages is locked by the front catch bar, the front points having entered amongst the threads, will begin to go up again to take up the work in the usual manner; and in so doing they let down the back catch bar in the usual manner, so as to allow the edge of that bar to drop into the back notches of the back division of the carriages; also as they go up, the points let down the tie lever, which, by relieving the tail of the back dividing bar, allows that bar to move back again by its spring, as usual.

“ The two divisions are thus locked at back and front respectively, and as the landing bars recede from the warp threads, the two divisions will be drawn out from between the warp threads; one division into the back combs, and the other into the front combs, as usual.

“ To divide the next time when all the carriages are on the front combs, and going backwards, they stop short before they arrive at the central position, as before stated, and the front catch bar is lifted up out of the notches of the carriages by its catch bar wheel in the usual manner; the back points then descend, to take up the work. In so descending they lift up the back catch bar, by the usual connection with the short lever that projects out from the back spindle bar, and the back points in their descent, and also cause the front dividing bar to move back towards the carriages by the following means:—

“ An arm *K*, is fixed to the back spindle bar (for the back points), and projects out forward therefrom; the end of it is connected by a link *p*, with the back end of a lever *q*, which is

poised by the middle on a fixed pin, supported by a bracket rising up from the cross bar ; and the front end of the same lever is connected by a rod *L*, with a short bent lever *M*, which moves on a fixed pin, that is supported by the front landing bar, and the end of the lever *M*, projects outwards before the front dividing bar in such manner that when the back points descend, and draw up the rod *L*, the latter will move the front dividing bar backwards towards the carriages. In so moving, the ends of the dividers take the edges of those carriages which are to become the back division, and push them back, without disturbing the other intermediate carriages. The carriages of the back division are thus pushed back by the front dividers, beyond the central position, until their back notches come exactly beneath the edge of the back catch bar, which bar is at that instant let down into those notches, by its usual connection with the short lever of the back spindle bar and the going up of the points.

“ By the time that the division is thus effected, and the back division of carriages is locked by the back catch bar, the back points having entered amongst the threads, will have taken up the work in the usual manner ; and in so doing, they cause the front catch bar to drop into the front notches of the carriages of the front division, by the usual connection with the driver of the front catch bar wheel, turning that wheel a little further round, and the back points going up a little further ; and they also allow the front dividing bar to come forwards away from the carriages, by releasing the parts *K*, *p*, *q*, *L*, *M*, before described. The two divisions of carriage are thus locked at front and back respectively ; and as the landing bars recede from the warp threads, the two divisions will be drawn one into the front combs, and the other into the back combs, as usual.

Here it is to be observed that in my mode of effecting the division (by stopping the landing bars short before they have moved the carriages to the central position), the carriages by the dividers, are always in that direction in which the carriages

are required to move, after the division is made, and no more motion is given to the carriages in the act of dividing them than is absolutely necessary, for only one of the division of carriages is moved by the dividers at each time—the other division standing still in the combs.

“ The upper end of the rod *L*, is not joined to the front end of the lever *q*, but the rod merely passes through a hole in a socket, at the end of the lever, and a thumb nut, which is screwed on the top of the rod *L*, comes to bear on the socket whenever the lever *q*, is required to draw up the rod, in the act of dividing, as before described. But when the front landing bar comes forwards in the regular course of working, and the front dividing bar comes with it, the rod *L*, moves freely upwards through the hole in the socket at the end of the lever, without giving any motion to that lever.

“ *To give motion to the points*, in order to take up the work, two wipers *P, Q*, are fixed upon the middle part of the length of the lower horizontal axis *E*, and revolve therewith; they are adapted to act (when necessary) upon rollers at the ends of two treadles *R, S*, the horizontal axles *T, V*, of which are supported in sockets at the back of the frame. The right hand treadle *R*, is to give motion to the front points, and the left hand treadle *S*, is to give motion to the back points, by means of upright rods, which extend as usual from each of those treadles, to the front ends of the working levers at the upper part of the machine; and the opposite or back ends of those levers are connected by links with the back arms of the spindle bars, in order that when either of the treadles *R*, or *S*, is pressed down, the point bar belonging thereto may also be brought down, in the usual manner of a Lever's machine; and when the said treadle is relieved, the points will be carried up again by their back springs, in the usual manner.

“ When the machine is worked by my improvements, the revolving wipers *P, Q*, act at proper intervals (in lieu of the feet of the workmen) to press down the treadles *R*, or *S*, by

acting on the rollers thereof. But those wipers must not act on the treadles every time that they turn round ; therefore the horizontal axes *T*, *V*, on which the treadles are fixed, are moved endways in their sockets, in the direction of their length, in order to remove the rollers at the end of the treadles *R*, or *S*, so much sideways out of the circular paths in which the wipers *P*, *Q*, revolve, that those wipers in their revolution with the horizontal axis *E*, will miss the said rollers, and produce no action on the treadles, unless the horizontal axis of that treadle which is to be operated upon is first moved endways, so much so as to bring the roller at the end of that treadle into the path of the corresponding wiper, which wiper will then, in the course of its revolution, press down that treadle, and actuate the points belonging thereto, in the same manner as in Lever's hand machines, when the workman presses down the treadle with the foot.

“ The horizontal axles *T*, and *V*, are thus moved endways by the following means, every time that the points are required to be put in action :—*W*, is a ratchet wheel, with eight teeth, fixed on one end of a horizontal axis *x*, which turns in suitable bearings, supported by the frame at the back of the machine ; *w*, is a driver, joined to one of the drawing tackle levers in a suitable manner, to move the wheel *W*, round, one tooth every time that the carrier bars are extended, and consequently at the same time as the guide bar wheels are moved. *X*, is a wheel fixed on the axis *x*, and turning with it ; *s*, is a lever applied horizontally above the wheel *X*, and *t*, another similar lever applied horizontally beneath the wheel *X*. The back ends of the two levers *s*, and *t*, are moveable about fixed centre pins, which are supported by a suitable brace from the frame, and each lever *s*, and *t*, carries a small roller near the middle of its length, to apply against the circular edges of the wheel *X*. The front ends of the two levers *s*, and *t*, are connected by two upright rods with the short arms of two bent levers *Y*, *Z*, which are poised by their middles upon fixed

centre pins supported by the frame, and the lower ends of the two levers  $Y, Z$ , apply to the extremities of the two horizontal axes  $T, V$ , of the treadles  $R, S$ .

" The two axes  $T, V$ , are always urged endways, one towards the other, by a horizontal spring  $y$ , the two ends of which are fastened to two hooks, one projecting out of the end of one axis  $T$ , and the other out of the end of the other axis  $V$ ; the action of the spring  $y$ , also urges the rollers of the levers  $s$ , and  $t$ , towards the edge of the wheel  $X$ . A notch is cut out in one part of the circumference of the wheel  $X$ , large enough to admit one or other of the rollers of the levers  $s$ , or  $t$ , into the notch, when it is turned towards either of them, but so long as the said rollers bear upon the circular edge of that wheel, the lever  $s$ , is thereby borne upwards, and the lever  $t$ , is borne downwards, in opposition to the action of the spring  $y$ ; and so long as that is the case, the two upright rods by which the ends of the levers  $s$ , and  $t$ , are connected with the upper arms of the bent levers  $Y, Z$ , being adjusted to a suitable length, will cause the lower ends of the said levers  $Y, Z$ , to keep the horizontal axes  $T$ , and  $V$ , removed so far endways one from the other, that the rollers of the treadles  $R$ , and  $S$ , will stand beside of the respective circular paths in which the wipers  $P, Q$ , on the horizontal axis  $E$ , revolve.

" When the time arrives for the carriages to be divided, the notch in the wheel  $X$ , will, by the progressive motion of that wheel, present itself to the roller of the upper lever  $s$ , if it is that time when the front points are to operate, or else to the roller of the lower lever  $t$ , if it is that time when the back points are to operate. And then the spring  $y$ , being no longer counteracted, will move that axis  $T$ , or  $V$ , of the treadles, whereof the lever  $s$ , or  $t$ , is set at liberty, by its roller entering into the notch of the wheel  $X$ , and the motion so given to the axis  $T$ , or  $V$ , by the spring  $y$ , will bring the roller of its treadle  $R$ , or  $S$ , into the path of the corresponding wiper  $P$ , or  $Q$ , and when as that wiper comes round in its circular path, it

will press down that treadle, and thereby give motion to the points belonging to it at the proper moment, and in the proper manner, as is usually done by the foot of the workmen in Lever's hand machines. And after the said wiper *P*, or *Q*, has passed by the roller of the treadle, and allowed the same to return, and consequently allowed the points to be carried up by their back springs, then the driver *w*, (which turns the ratchet wheel *W*, round one tooth every time the landing bars are extended), causes the notch in the wheel *X*, to move away from the roller of the levers *s*, or *t*, and that wheel presenting its edge to the said roller, causes the said levers *s*, or *t*, by its connection with the bent lever *Y*, or *Z*, to force the axis *T*, or *V*, of that treadle *R*, or *S*, which has just been operated upon so much endways in opposition to the spring *y*, as will remove the roller of that treadle sideways out of the circular paths of that wiper *P*, or *Q*, which operated last time, so that the said wiper will produce no effect the next time it comes round. And in that manner the parts will remain until the carriages have been passed three times between the warp threads, and then at the fourth time when the carriages are to be again divided, the ratchet wheel *W*, having been turned a tooth each time, will have gone half round, so as to present its notch to the roller of the opposite lever *s*, or *t*, to that which was set at liberty at the last time of dividing, and thereby the other treadle, and wiper, and points, which stood still the last time of dividing, are brought into operation, and those which then operated, now stand still, and so on.

“ And further, by way of safeguard, to keep up the points to their proper places in the meshes of the lace after they have taken up, I fix two wheels 1, and 2, upon the horizontal axle, *x*, before described, and I place a horizontal lever 3, and 4, beneath each wheel. The levers 3, and 4, are moveable about fixed centre pins at their back ends, those pins being supported by suitable brackets from the frame. Each lever 3, and 4, has a roller near the middle of its length, to apply to the edge of

its wheel 1, or 2, and there is a connecting link 5, and 6, from the front end of each lever 3, and 4, up to the back arms of the spindle bars for each set of points. Each wheel 1, and 2, has a notch in one part of its circumference to admit the roller of its lever 3, or 4, at the time when the points belonging to that lever are to be brought into operation by the combined action of the wheel X, and one or other of the wipers P, or Q, as before described. But when the circular edges of the wheels 1, and 2, apply to the rollers of the levers 3, and 4, they will, by their links 5, and 6, confine the back arms from rising by any accident, and will act in aid of the back springs, which are applied in lieu of the usual back weights, to secure the points from descending until the proper time, and then the notches in the wheels 1, and 2, will (one or other of them) be presented to the rollers of the levers 3, or 4, so as to release the points to which that wheel and lever belongs. The points that are so released, whether back or front (and the time when they are released) will always be the same as those which the wheel X, brings into action by one of the wipers P, or Q, and other means above described.

“ Having now described a machine constructed and working according to my improvements, I do hereby declare that what I claim as my invention under the said Letters Patent, is that particular combination of parts, and machinery herein before described (taken as a whole) to be added to Lever's lace machinery, in order to derive from an uninterrupted and continuous circular motion of one handle or revolving axis, all the motions requisite for the several parts of such Lever's lace machinery in due order and succession for making lace thereby. And I do not claim the invention of any particular parts or machinery of which that combination is composed, excepting the crank rods herein before described, which lengthen out together with the parts which occasion them so to lengthen at the proper time, for the dividing of the carriages to be performed in the manner hereinbefore described; for it is by means

of that improvement that I am enabled to give the requisite alternating motions to the landing bars and catch bars, by means of cranks which revolve incessantly without stopping. And in particular, I do not claim the application of revolving cranks to give alternating motions to the bars of Lever's machinery, the same having been applied heretofore; but not in such manner as to avoid stopping or suspending their motion whilst the dividing and taking up is performed.—[*Enrolled in the Inrolment Office, February, 1830.*]

Specification drawn by Mr. J. Farey.

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*To ELIJAH GALLOWAY, of King Street, in the borough of Southwark, engineer, for his invention of certain machinery for propelling vessels, which improvements are applicable to other purposes.—[Sealed 2nd of July, 1830.]*

THERE are two distinct inventions embraced by this patent, the one is a contrivance by which a rotary motion is obtained from the pendulous action of a vibrating piston within a steam cylinder; the other, a peculiar mode of working a series of moveable paddles connected to a paddle wheel, by means of which the respective paddles are made to enter the water, and leave it in such positions as shall meet the least quantity of resistance from the water in a perpendicular direction.

Plate IX, fig. 1, is a transverse section of a steam cylinder *a, a*, supported by a suitable frame work of iron; *b*, is the axle passing through the middle of the cylinder longitudinally, to which is attached a piston *c*, intended to revolve, or rather vibrate to and fro, in an arc equal to about three fourths of the internal circumference of the cylinder; *d*, is a piece of metal of a wedge form fixed within the cylinder as a steam stop, which limits the extent of vibrations of the piston *c*.

If steam from a boiler be conducted through the pipe *e*, to the valve box *f*, it will pass from the central part of the box through the induction aperture, by the channel *g*, to that part of the cylinder which is on the right hand side of the piston, and by its elastic force the steam will drive the piston towards the left. A crank *h*, (shewn by dots) at the end of the axle, will by the movement of the piston, be also driven toward the left, and carry with it the sliding curved piece *i*, (also shewn by dots), and by means of the jointed connecting rod *k*, *k*, will cause the crank *l*, on the shaft of the fly wheel of the engine to be driven through part of its revolution.

An eccentric on the fly wheel shaft has by these means now moved the rod *m*, and shifted the valve *f*, so as to bring the induction aperture opposite to the opening of the channel *n*, when the steam will pass through that channel into the cylinder on the left hand side of the piston, and drive the piston back again to the right, which carrying the crank *h*, and the curved piece *i*, (shewn by dots) also towards the right, by means of the connecting rod *k*, drives the crank on the fly wheel axle round the other half of its circuit. At the same time the turning of the valve *f*, has opened the channel *g*, to the exusion, and the steam on that side of the piston then rushes out of the cylinder, and escapes by the pipe *v*, into the atmosphere or elsewhere.

This is the construction and action of this improved steam engine, in which the vibratory movements of the piston causes the rod *k*, to impel the fly wheel, and hence to propel vessels, or drive other machinery; the crank *h*, and curved piece *i*, shewn by dots, and the rod which connects them to the fly wheel, being the particular feature of novelty claimed by the Patentee.

Fg. 2, is a side view of a paddle wheel for propelling

vessels with five moveable paddles *a, a, a, a, a*, which are mounted on pivots attached to the pentagonal framework; to each of these paddles is affixed, at a certain angle; a tail lever *b, b, b, b, b*, and at the extremity of each of these tail levers, a rod *c, c, c, c, c*, and *d*, is connected, by a joint: the reverse ends of the rods being attached to a disc *e*. This disc is mounted so as to turn upon a crank *f*, on the main axle of the wheel, and four of the rods *c, c, c, c*, are attached to it by joints, while the fifth, *d*, is made fast thereto by a screw bolt.

If rotary motion be given to the main axle of the wheel, the lower paddle *a 1*, in rising to the situation of *a 2*, will by means of the fast rod *d*, turn the disc *e*, partly round upon the crank; and by that means keep the paddle nearly in a perpendicular position when it quits the water; at the same time all the other paddles will be moved a little, and as they come successively into the water will approach a perpendicular line, and retain nearly the same positions during their propelling strokes until they quit the water.

This contrivance is designed to prevent the inconvenience experienced in paddle wheels with fixed radial paddles, which in entering the water come down upon its surface, almost in a flat position, and rise out of the water in the same way, in one case lifting the vessel out of the water, and in the other depressing it, whereby a great expenditure of power, employed in driving the paddle wheels, is rendered of none effect, and by which useless force the progress of the vessel is rather impeded than facilitated.

Many attempts have been made to avoid the inconvenience, occasioned by the employment of fixed radial paddles, but none of them seem to have been sufficiently simple to answer the purpose, except on still water, nor

does the present plan appear to be exempt from the like objection. A contrivance, which bears some resemblance to this, will be found in the Vol. XI. of our First Series, page 349, under the head Lieut. Hill's Patent.—[In rolled January, 1830.]

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*To EDWIN BUDDING, of the Thrupp, in the parish of Stroud, in the county of Gloucester, Machinist, for his having invented a new combination and application of machinery, for the purpose of cropping or shearing the vegetable surfaces of lawns, or grass plats of pleasure grounds; constituting a machine which may be used with advantage, instead of a scythe for that purpose.—Sealed 31st August, 1830.]*

THIS machine is constructed something like a horse hoe, that is it moves forward upon wheels or a broad roller, and is guided by handles held by the person who conducts it. At the front there is a fixed straight edge or blade of steel, which is brought in contact with the ground, that is as low as the grass will allow, and against this straight edge there is a cylinder or drum with twisted cutting blades, or knives, which are driven round as the machine advances, by a train of toothed wheels, actuated by the running on carriage wheels, which cause the rotary blades to act as they revolve against the fixed blade and constitute shears, like the improved cutters of a machine for cropping woollen cloth upon the rotatory principle. The construction of the machine is shewn Plate IX.

#### SPECIFICATION.

“ Figure 3, is an elevation of the left side, and figure 4, a ground plan of the machine, the same letters refer-

ing to the same parts in both figures; *a, a*, is the cast iron frame; *b*, and *c*, are two wrought iron bars with screws at their extremities for connecting the opposite sides of the said frame; *d*, is a hollow cylinder or drum of cast iron, fixed on the horizontal axis *e*, having its bearings in the under edge of the frame *a, a*, and *f*, is a toothed wheel fixed on the same axis *e*, to drive the pinion *g*, when the drum *d*, is made to roll on the ground; *h*, is a horizontal wrought iron axis, turned round by the said pinion *g*, when the machine is in action; *i*, is a toothed wheel fixed on one end of the axis *h*, to drive the pinion *k*, which is fixed on one end of the horizontal axis *l*; three brass rings *m, m, m*, are fixed on this axis *l*, to carry the revolving spiral cutters *n, n*, which are made of thin steel plates, tempered and fixed on by screws, or let into grooves in *m*.

“ The number of the said spiral cutters so fixed may be from four to eight or more; *o*, is a rectangular steel plate tempered, having its front edge towards *n*, and a little bevelled like a blunt chisel. This steel plate *o*, is fixed by screws against the under side of the horizontal cast iron bar *p*, which is fixed by its extremities to the sides of the frame *a, a*, at bottom; *q*, is a horizontal solid cylinder of cast iron, having its bearings screwed against the insides of the frame *a, a*, by screws, which pass through chase mortices, in order to allow of an adjustment of the height of the cutting plates *n, o*, above the ground; the whole machine bearing on the cylinders *d, q*, when in action, as well as when at rest.

“ A wood handle *r*, is for the right, and *s*, is a similar one for the left hand of the workman. There are bearings *t, t*, for the axis *l*, screwed to the outsides of *a, a*, which screws pass through chase mortices, to allow an adjust-

ment of the edges of  $n$ , to  $o$ . Vertical screws pass through projecting parts of  $a, a$ , and bear against the upper and lower edges of  $t, t$ , in order to fix them when adjusted. There is a front horizontal bar  $u$ , connecting the opposite pieces  $t, t$ ; the ratchet wheel  $v$ , is fixed to the pinion  $g$ ; the sliding gland or box  $w$ , is fixed by a feather to the axis  $p$ , with which it therefore always turns, and contains a click or pall, for taking out the teeth of the ratchet wheel  $v$ , when  $w$ , is pushed over it by the lever  $x$ ; the centre of motion of this lever is on the bar  $b$ ; a notch in the bar  $c$ , serves to lock the end of the bent level  $x$ ; when  $w$ , by acting on  $v$ , compels  $g$ , to drive  $h, i$ . The bearings of  $h$ , are  $z, z$ , which are screwed against the outsides of  $a, a$ , the screws passing through chase mortices, to allow an adjustment of  $i$ , to  $k$ , after adjusting the pieces  $t, t$ . When  $w$ , is moved from  $v, v, g$ , will turn loose on  $h$ , and the machine may be rolled along on  $d, q$ , without communicating motion to the cutters round the axis  $l$ .

*“Operation of the machine.—*The various parts being adjusted, and the upper end of the lever  $x$ , placed in the notch, the workman takes hold of the handles, and by pushing forward the machine, the drum  $d$ , rolls upon the ground like the wheel of a wheelbarrow, at the same time turning  $f$ , which drives  $g$ , and  $i$ ; and this wheel  $i$ , drives  $k, l, m$ , making the revolving cutters act rapidly by their smooth outer edges against the edge of the fixed cutter  $o$ , so as to crop or shear the grass or vegetable surface. At the same time the cylinder  $q$ , rolls on the ground to regulate the height of  $o$ , and consequently the closeness of the cutting or shortness of the grass left.

“To keep the roller  $q$ , sufficiently free from any adhering substances, the horizontal bar  $y$ , connecting the

opposite pieces, serves as an axis for a thin iron scraper, curved so as to form a portion of a cylinder or arch, having its lower edge bearing on the surface of *q*.

“ The speed with which the machine is pushed forward when at work is not material, because the number of cuts will always be in the same ratio with the space rolled over by the drum *d*.

“ The revolving parts may be made to be driven by endless lines or bands, instead of teeth. It is advisable to employ the machine when the grass or vegetable surface is dry; and when high grass is to be cut, it is best to shear it twice over, lowering *o*, *n*, by adjusting previous to the second course or kerf.

“ Grass growing in the shade too weak to stand against a scythe to be cut, may be cut by my machine as closely as required, and the eye will never be offended by those circular scars, inequalities, and bare places so commonly made by the best mowers with the scythe, and which continue visible for several days; country gentlemen may find in using my machine themselves an amusing, useful, and healthy exercise.

“ I do not claim as my invention, the separate parts of my machine, considered without reference to the effects to be produced by them; but I do claim as my invention, the described application and combination for the specified purpose.”—[*Enrolled in the Petty Bag Office, October, 1830.*]

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*To JOHN ALEXANDER FULTON, of Lawrence Pountney Lane, Cannon Street, in the city of London, Merchant, for his having invented an improvement in the preparation of pepper.—(Sealed 20th March, 1830.)*

IN November, 1827, a patent was granted to the above gentleman, for blanching black pepper, by immersing the berries in water until their external coatings became swelled, and afterwards placing them in heaps for the purpose of their acquiring heat, which caused the skins to rot, and readily peel off, leaving the pepper corn clean and white. The present patent is for accomplishing the same object by mechanical means, which is effected in the following way:—

“ Take a quantity of pepper and put it into a mill, constructed, and worked in a similar manner to those used for preparing pearl barley, and similar purposes, except that the inside surface of the case had better to be quite smooth, and to move in a contrary way to the stone.

“ The process is to be continued until the whole or greater part of the husks are broken off, when on being separated from the dust and husks, the pepper is sufficiently prepared to be ready for sale or use.

“ As my invention consists in removing by *machinery* the husks from pepper, and hitherto the outer husks only have been taken off by chemical processes, I shall consider any means made use of, for the purpose of removing the husks by *machinery*, as an infringement on my patent.”  
—[*Inrolled in the Inrolment Office, September, 1830.*]

To JOSEPH D'ARCY, of Leicester Square, in the county of Middlesex, Esq. sole executor and residuary legatee of Charles Broderip, late of Spring Gardens, in the parish of St. Martin's in the Fields, in the same county, Esq. deceased, for certain improvements in the construction of steam engines, and the apparatus connected therewith.—[Sealed 29th November, 1828.]

THE objects of these improvements are, first, to simplify the construction of steam engines, and render them less bulky and ponderous, consequently occupying smaller spaces than engines of similar power upon any of the known constructions; and, secondly, economizing of the steam and fuel, by an improved mode of supplying the steam to work the engine through a steam reservoir separate from the boiler, which is fed by valves worked at intervals.

The first of these objects is effected by the novel construction and adaptation of the piston rod and its appendages, and of a vibration beam; both of which contrivances are shewn in Plate IX.

Fig. 5, is a transverse section of a vessel with a pair of engines erected therein, adapted to propelling. Fig. 6, is a longitudinal section of the same, shewing one of the working cylinders with its air pump and condensor; *a, a*, is the boiler shewn by dots; *b*, the reservoir of steam, from whence the working cylinders *c, c*, are supplied; *d*, is the air pump; *e*, the condensor; *f*, the foot valve; *g*, the discharging valve, and cistern or hot well; *h, h*, are the feeding pumps; *i*, connecting rods for the air pumps; *k*, cranks for working them; *l, l, l*, the paddle wheel shaft, with the main cranks *m, m*, to which the piston rods *n, n*, are connected; *o*, a slider which covers a long slot, or aperture in the cap of the cylinder: through this aperture and slider the piston rod *n*, passes, and vibrates to and fro, moving the slider *o*, with it; *p*, is the piston, which is attached to the piston rod *n*, by a joint *q*, and the piston rod passes through a

ball and socket in the slider *o*. The induction and exduction passages at *r*, *r*, are worked by a slide valve through the agency of a rod, and an eccentric, as usual.

Upon this construction an engine may be worked without the intervention of any cross head, side rods, guide frames, or parallel motion to keep the piston in a perpendicular position while ascending and descending in the cylinder ; the improved method of connecting the piston to its rod, by means of a joint, which shall allow the piston to oscillate as the crank moves round, and a ball and socket in the sliding part of the cap or cover of the cylinder, rendering the usual appendages unnecessary.

The slider *o*, forms the most essential feature of this part of the invention ; the cap or head of the steam cylinder having a slot or long hole in it for the piston rod to work through, must be covered by a perfectly steam tight joint, and to effect this the slider is made with dove tailed edges at the under part, working in the slot, and sufficiently long and broad on the flat part to cover the slot at all times, as the slider moves to and fro.

It is proposed, under some circumstances, to dispense with this slide, and to affix to the upper side of the piston, a tube as at fig. 7, which shews a section of a working cylinder *c*, *c*, and piston *p*, the rod *n*, being attached to the piston by a joint at *q*, and vibrating as the crank *m*, (to which it is connected) goes round. The tube *s*, *s*, is securely attached to the upper surface of the piston, and moves up and down with it, the sides of the tube being packed perfectly tight against the top part of the cylinder.

The patentee says that this method of using an oscillating piston rod, not only answers very well, but enables him to dispense with the sliding stuffing box, represented in figs. 5 and 6 ; yet he prefers, for many reasons, the employment of the sliding stuffing box in conjunction with the oscillating piston rod in all double engines. " The benefits and advantages resulting from

an oscillating piston rod, and a sliding stuffing box, are manifest, that any person conversant with steam engines, will readily admit them, as far as regards their simplicity, efficacy, and saving of room are concerned; and valuable as they are for land steam engines, they are still more valuable in engines employed for navigable purposes."

The improved compound connecting beam is shewn in the representation of part of a boat engine, with horizontal cylinders at fig. 8, the object of which compound connecting beam is to receive motive power from one crank, and convey such motive power to another crank at any required distance; *a*, is the spur wheel shewn by dots, which is put in motion by the rotation of a crank on the main shaft *b*, driven by the piston rod in the way above described. From this main shaft a crank *c*, extends, which is connected by a joint to the compound connecting beam *d, d, d*. The guide crank *e*, is fixed on a shaft *f*, by means of a pin, to which the centre arm of the compound connecting beam is united; it acts as a guide or stay to regulate, direct and support its movements; *g*, is the shaft of the paddle wheels; *h*, the crank which connects the paddle wheel shaft to the extreme end of the compound connecting beam.

" This compound connecting beam will be found to be a most convenient agent for horizontal marine engines, as it will allow such engines to be fixed lower in any vessel, or boat, and at the same time convey the motion and power of such engines to the shafts of the paddle wheels, at any desired distance from the first point of rotation, which such engines may produce."

The plan for economising steam, and consequently saving of fuel, consists in passing the steam from the boiler into a reservoir or receiving vessel, which is in contact with the boiler, as shewn by dots at fig. 5, and in which vessel the steam is intended to acquire an additional quantity of heat, for the purpose of increasing its elastic force prior to its admission into the working cylinder. The steam is to be admitted into this vessel at intervals, by means of a valve, which is to be opened

by a suitable apparatus connected to the working part of the engine.

The patentee says " The essence of this part of the invention is, in having constructed and applied a valve or valves, cock or cocks, for keeping open and closing the communication when required between the steam receiving vessel and the boiler or boilers with which it is connected; a considerable portion of which steam receiving vessel I insert and enclose in any boiler with which it is united; but in boilers used for marine engines, the chimney which receives the smoke and heated air from all the flues of such boilers, I convey through the steam receiving vessel in a horizontal direction to the greatest convenient distance it will permit, and then the chimney quits the steam receiving vessel in a vertical position, the heated air imparting in its passage through the chimney as much caloric to the steam as it will absorb.

" This receiving vessel is re-filled with steam from the boiler or boilers at every three or more strokes of the engine as may be required, by means of valves, which are opened or closed by suitable machinery, according to the dimensions of such steam receiving vessel, and the capacity of any cylinder or cylinders to be supplied with steam from it. Having by this steam receiving vessel the means of depositing in it any desired quantity of steam, of any required pressure, by the judicious management of any ordinary throttle or intermediate valve, the same will regulate the supply of steam to the cylinder or cylinders in such manner as shall effect the greatest possible saving of steam in reference to the resistance on such piston or pistons of such cylinder or cylinders.

" I do not claim as the invention of the said Charles Broderip, the introduction or use of a steam receiving vessel, nor of any of the apparatus for regulating the quantity of steam to be admitted into a steam cylinder or cylinders, by means of throttle and other valves being placed between the receiving vessel and steam cylinder of any engine, because

am aware that these contrivances and expedients have been used with more or less effect. My improvement upon these contrivances is the introduction of valves or cocks to supply the steam receiving vessel from the boiler or boilers ; and when this is effected, then to close and shut off, by the agency of the steam engine, the communication between the boiler or boilers and the steam receiving vessel, and to open and close the communication at any desired and stipulated period. I prefer the particular description of valve and apparatus described, although other cocks, slides, or valves may accomplish the desired object with more or less effect ; but it is the expedient of placing any suitable apparatus between the boiler and the steam receiving vessel, with confident means to open and close the communication between them at any stipulated period, or for any stipulated time, that constitutes the leading feature of this part of the invention."—[*Enrolled in the Inrolment Office, May, 1830.—N.B. Eighteen months were allowed for the enrolment of this specification.*]

Specification drawn by Mr A. Galloway.

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*To GEORGE STOCKER and ALEXANDER STOCKER, both of the parish of Yeovil, in the county of Somerset, Gunsmiths, for their invention of a cock for drawing liquor from casks, which produces a stop superior to that which is effected by common cocks, and will continue in use for a longer period of time.—[Scaled 26th January, 1830.]*

THIS invention is said to consist in causing the passage for the liquor through the cock, commonly called the way of the cock, to be opened or shut by means of a *conical plug*, rising from, or descending into, as the case may be, a conical part of the said passage or way. Thus far the intention of the patentees appears evident enough, but on looking to the rude

figure which as a drawing, is appended to the specification for the purpose of further explaining the invention, we are scarcely able to comprehend its construction. The plug is enclosed within a socket, and consequently is to be turned by a key ; there appears to be a worm round the socket, in which some pieces, extending from the stem of the plug are to work, and as it turns, carry the plug up or down. The plug itself is said to be conical, but not so represented, and the recess into which it is to descend must be conical also, but does not appear so in the figure.

The plug is to be made of wood ; yew tree is thought to be the best, " but it may be made of metal, leather, or any other suitable composition, provided that the substance used be softer than that of the conical passage into which it fits."

The patentees say, " now whereas we claim as our invention the method hereinbefore described of opening and shutting the passage for the liquid or way of the cock, by means of the conical plug, and conical part of the passage ; and such our invention being to the best of our knowledge and belief entirely new, &c."—[*Enrolled in the Petty Bag Office, March, 1830.*]

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*To RENI FLORENTIN JENAR, of Bunhill Row, in the parish of St. Luke, and county of Middlesex, Gentleman, for his invention of certain improvements in lamps.*  
[Sealed 4th July, 1827.]

THE subject of this patent is a table lamp on the pneumatic principle, that is a lamp, in which the oil is forced up a column to the wick or burner by the pressure of condensed air, confined in a close chamber at the lower part of the stand.

The lamp is intended to be constructed in the form of

an architectural column with a large base, in the lower part of which the oil is placed, and the vessel being very strong, and perfectly sound at its joints, a quantity of air is forced into it by means of a small piston, which is an air pump, and the elastic force of this air, when condensed by the pump acting upon the surface of the oil below, forces it up the central column to the wick or burner.

Thus far the principles on which this lamp is constructed, are precisely the same as Michell's patent Barrington lamp, see Vol. II. page 354, of the First Series of this Journal, and Vol. II. page 321, of our Second Series; but the feature of novelty proposed by the present patentee, is a tube which he calls a *capillary tube*, intervening between the reservoir of oil and the burner, for the purpose of conveying the oil up to the burner, without allowing it to be directly forced so high by the pressure of the condensed air, which would, without the intervention of this capillary tube, be very subject to flow over, and even to jet out at the top in a fountain.

This capillary tube being long, and of small diameter, prevents the oil from flowing too freely up to the burner; and in case any more oil should rise than is consumed by the burning wick, there is a provision for its falling over and descending again through a pipe into the reservoir.

The piston of the air pump is to be furnished at top with a thumb-piece, sufficiently large to work it until the air vessel is full; but the leverage being very small, the thumb will not be enabled to continue working the piston after the vessel is properly charged with air. A helical spring is placed round the conical end of the piston, for the purpose of throwing it up, after it has received its down stroke by the pressure of the thumb. The external form of the lamp may be any that taste may dictate, provided

it is capable of containing the apparatus within for effecting the objects desired.—[*Enrolled in the Enrollment Office, January 1828.*]

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*To THOMAS PEEK, of St. John Street, in the parish of St. James, Clerkenwell, in the county of Middlesex, engineer, for his invention of the construction of a new engine, worked by steam, which he denominates a revolving steam engine.—[Sealed 1st Aug. 1827 ]*

THIS steam engine, though called a revolving engine, is really upon the reciprocating principle, and scarcely in any one minute particular differing from those of the ordinary constructions, excepting in the strange anomaly of putting the cylinder, with its piston and rods, in rapid rotation round a fixed toothed wheel, instead of actuating the wheel by a piston working in a fixed cylinder, as is the common mode.

Upon a substantial horizontal frame work of iron, a hollow axle, carrying a pair of fly wheels is mounted, in the centre, between which pair of wheels the working cylinder of a steam engine is placed, and made fast by screws, and bolts, to both the wheels in the direction of their diameters; the cylinder being so nearly balanced as to allow it and the connected fly wheels to turn freely round with the hollow axle.

Through the cap of the working cylinder and the stuffing box the piston rod extends, and is at its outer extremity connected through the medium of radius rods and sweep rods to crank pins, or eccentric pivots, on the faces of two toothed wheels, mounted on pivots, fixed in the opposite arms of one of the fly wheels. The reciprocating action of the piston in the working cylinder by means of these connecting rods, gives rotatory motion to the toothed wheels, and the teeth of these wheels taking into a stationary wheel or circular rim of teeth, fixed to

the standards or frame-work, causes them to run round the toothed rim, and to carry the cylinder with the fly wheels and hollow axle round with sufficient power, as a first mover, to drive any other machinery.

The steam intended to actuate the piston in the cylinder is to be of the high pressure kind, and to pass by a pipe from the boiler through one of the hollow axles to the valve-box, where the slide for effecting the induction and eduction is to be worked by a rod and tappets, or an eccentric, or any other suitable contrivance connected to the rotatory part of the engine, and the eduction steam is to pass off by the hollow axle on the opposite side.

The contrivance is said to be applicable to various constructions of steam engines, and is to be considered new only as respects the mode of driving the cylinder, fly wheels, and axle round, by directing the reciprocating power of the piston through the agency of connecting rods, to give rotatory motion to spur wheels, which take into a fixed circular rack, and thus cause the rotatory motion of the principal parts of the engine.—[*Enrolled in the Insolvent Office, February, 1828.*]

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*To THOMAS SOWERBY, of Change Alley, Cornhill, in the city of London, Merchant, for his invention of certain improvements in the construction of Ship's windlasses.*

—[Sealed, 4th July, 1827.]

THE object of the Patentee is to prevent the recoil of a windlass, when in the act of raising the anchor, and to hold it securely when raised, which, in the ordinary construction of windlass is effected by palls dropping into a ratchet wheel placed at the end of the windlass upon the same axle.

As these palls are but slight, and are apt to break by a sudden recoil, or may happen to be raised out of the ratchet at the time when they are required to take effect, it is proposed to adapt a segment piece with teeth, which shall at all times

be in gear with the ratchet-wheel, and thereby prevent any accident which a sudden recoil of the windlass might otherwise produce.

Plate IX. fig. 9, represents a windlass in traverse section ; *a*, is the wooden barrel, and *b*, the ratchet-wheel, or rim of teeth, which barrel is supposed to be mounted in suitable standards, and enabled to revolve upon its axis ; *c*, is the segment pall piece with teeth, suited to fit exactly into the teeth of the ratchet-wheel. This segment piece is allowed to slide up and down upon its iron bearing, and is kept in its situation by a pin passed through a slot.

When the windlass is turned round in the direction of the arrow, as in drawing up the anchor, the segment pall piece *c*, rises sufficiently to permit the ratchet teeth of the wheel to pass those of the segment ; but, if by a recoil, the windlass should attempt to turn the reverse way, the teeth of the segment pall piece instantly take hold of the ratchet-wheel, and lock the windlass firmly.

It is obvious, that when it is desired to let the cable and anchor run out, it is only necessary to raise the segment pall piece *c*, and the windlass becomes free to run round.

In order to give additional security to the locking, when the anchor is raised and suspended by its cable, another segment pall piece *d*, is placed below, which rises and falls in the same way as that above described ; and, in order to bring the teeth of this segment pall piece or chock *d*, into gear with the ratchet-wheel, the wedge *e*, must be slidden forward horizontally, which raises the chock *d*, and keeps it firmly locked to the ratchet-wheel of the windlass.

It must be obvious, that this is a much more secure mode of holding the windlass than by the ordinary palls, and from its great simplicity, there is no doubt but that it will be very generally adopted on shipboard.—[*Enrolled in the Enrollment Office, September, 1827.*

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*To JOSEPH MAUDSLEY, of Lambeth, in the county of Surrey, Engineer, for his invention of certain improvements on steam engines.—[Sealed 1st August 1827.]*

A VERY short specification describes the subjects of this patent. They are divided into six different heads: 1st. An improvement in the general arrangement of all the parts of a steam engine, the individual parts not being new in themselves. 2d. Constructing the frame-work or standards, which are to support the engine, in the form of a triangular prism. 3d. The adaptation of a D, valve for the induction and eduction of the steam. 4th. The employment of eccentricities on the rotary parts of the engine to work this D valve. 5th. Conveying the steam from the gudgeon to the working cylinder ; and 6th. The formation of the slide case.

To the specification is appended a large drawing, representing a steam engine with a swinging or vibrating cylinder, and the reference to the drawing, states, in the most superficial and general way, that A, is the frame work, B, the cylinder, and so on ; but as to any particular explanation of the invention, as described above under the six several heads, not a word is said upon the subject, except the enumeration of parts above recited, and we are left to conjecture what are the particular points intended to be claimed: which the reader will be as able to determine as ourselves.—[Enrolled in the Inrolment Office, December, 1827.]

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*To EDWARD DODD, of Berwick Street, Soho, in the county of Middlesex, musical instrument maker, for his invention of certain improvements on piano-fortes.*  
[Sealed 26th July, 1827.]

IT may be thought a very extraordinary description of this invention to say it is something about placing the sound board of a piano-forte upon ribs, leaving hollow spaces under it, and extending the dimensions of the sound board an inch or two at the base part: yet, such is the vague and defective explanation which the specification gives of this invention, that we really are unable to afford a more lucid explanation of its construction, or to give our readers any further clue to the object intended by the patentee, or to the claim of invention or novelty which he may consider himself to be the author of.

A representation is given of the kind of hammer which is employed to strike the strings; the form is the same as usual; but the outer piece of leather, which wraps round the point of the hammer, is to be glued at one end to the wood, and at the other end made fast by a small clamp piece and screw. The object of this is not expressed, but we presume that the outer piece of leather, being connected to the end of the hammer in this way, instead of attaching it by glue, will cause the blow given by the hammer upon the string to be softer, and produce a less wirey tone than the old construction of hammer, and also admit of the leather being tightened up, if it should become loose by wear.—[Inrolled in the Inrolment Office, January, 1828.]

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## ON THE EMPLOYMENT OF MACHINERY.

THE expediency of employing machinery in our manufactures has been, for years past, a subject of much diversity of opinion, and from the popular feeling at the present moment, it would appear, that its advocates are considerably in the minority. It is even a question with those, who appreciate the advantages of machinery, whether its employment ought not to be limited. For our own part we consider this subject as one of the first importance—in a national point of view, and embracing a very widely extended range of consequences.

It is not alone sufficient to argue, that machinery diminishes—the quantity of manual labour, which would otherwise be requisite for to conduct our manufactures, it must also be taken into the account, that by means of machinery, we are enabled not only to increase greatly the quantity of articles produced, but also to make them at a much lower price than could be effected solely by manuel labour ; the consequence of which, is a greatly extended demand for those articles, among that class of the community, where formerly such things were scarcely known, and certainly not used.

This it will be said, is arguing at large, without any definite point, upon which the *pro* and *con* may be stated, and the question, as respects that particular point, settled beyond dispute. Let us then take one subject, the manufacture of woollen cloths ; perhaps, the very first art that was ever practised by mankind, and which we may fairly presume to have originated when man was in a state of primeval ignorance or semi-barbarism ; at a time when the human intellect had scarcely expanded so far, as to conceive those things, which have subsequently formed the most essential comforts, indeed the indispendible necessa-

ries of life ; may we not consider clothing of wool one of them ?

In the infancy of the social world, when the rocky cavern or the umbrage of a closely mantled wood, constituted the only shelter, by which man could protect himself from the rude elements, next to procuring food for his daily sustenance, he naturally sought some artificial means of providing clothing, to cover and keep warm his naked body ; and finding that nature had bountifully furnished all other animals but himself with furry skins, or feathers, his ready course appeared to be, depriving those animals of life, and appropriating their skins for his own covering : forgetting that he, the lord of all animals, alone had **REASON**, which should have led him to effect that by **ART**, which had wisely been withheld by nature.

Necessity, however, soon brought this truth to man's conviction, that he must " live by the sweat of his brow," and as his species began to multiply, sufficient clothing could no longer be obtained for all, from the precarious chances of the chace. Then arose the idea of constructing artificial skins or coverings : and here, the first efforts of art were displayed, in combining such superfluous tufts of hair, wool, and feathers, as might have fallen upon the ground, or have been caught in the bushes and brambles : which when interwoven like a bird's nest, or stuck together by any adhesive matter, would, though imperfectly, supply the clothing sought ; indeed of such kind of manufacture are the habiliment of savage nations, at this very day.

Of all the coverings of animals, the shorn fleece of the sheep afforded the greatest facility of adaptation as a clothing for mankind. Even accident pointed out that wool, when pressed with moisture, would become matted or felted together, and constitute a substance capable of clothing and keeping warm the human frame ; but this

needed no effort of the mind. Some early genius having twisted rushes together, and made cords, invented the plaiting of them into wicker work, for the constructing of huts, or the first artificial erections for the residences of our primitive ancestors. This was an effort of art; but it was a greater genius that first devised the art of inter-weaving cords, made of twisted wool, into a broad sheet, to constitute a covering for tents, or a garment for the human species—perhaps a Belus, a Hermes, an Osiris, or some other of those illustrious names of antiquity, which grateful man has ignorantly deified, in commemoration of his usefulness in his generation when upon earth: and shall we in our enlightened age neglect, condemn, despise that genius and art, which shines around us, and of which we ought to be as ambitious as all neighbouring nations are envious. Let the self approving, sapient, political economist point out to us where we may stop in a retrograde march of the arts?

If we were to trace the progress of invention, which has through a series of ages brought the art of manufacturing woollen cloth to that state of facility and excellence in which we now find it, the subject would expand itself to a volume; we shall therefore merely point out some of the striking consequences of employing machinery in that art, within the last half century.

It is an unquestionable fact, that almost all marks of society in our own country, a few centuries back, had their clothing principally of leather; some of the superior orders wearing linen for their under garments, but very little woollen cloth, even of a coarse quality was then used, and that was not manufactured here, but imported from a foreign country.

Before the time that Sir Richard Arkwright introduced his machinery for preparing and spinning cotton, which was toward the end of the last century, the spinning and

preparing of wool was performed by the fingers of peasants, unassisted by any mechanical apparatus, but the old spinning wheel, and a few hand tools for opening, separating, and cleaning the wool ; those important inventions naturally led to the appropriation of similar machinery for the woollen manufacture, and the consequence is, that instead of a few peasants occasionally engaged in the tedious operation of spinning wool by hand, we have now, at a fair computation, very little less than a million of persons in this country, deriving their sole subsistence from the art of spinning and preparing wool by machinery. and from the consequent cheapness of the goods produced, there is not a person, of whatever condition in life, from the highest to the lowest, but is now clothed in woollen garbs of some kind, as their price bringing them within the reach of every one.

Such is the consequence of our extensive employment of machinery ; indeed, it is questionable, whether the united efforts of the entire population of this island could produce by hand labour, unassisted by machinery, as of old, a sufficient quantity of woollen goods to supply our home consumption, and exportation, as the demand now stands in the British market.

We are almost exclusively indebted to our mechanical inventions for the vast commercial intercourse we have for years carried on with foreign nations. Who is there that knows not, our trade at one time consisted solely in exporting raw tin, and sheep's wool. Is it not now acknowledged, that every useful article for the wants and convenience of mankind, is made amongst us, and both cheaper and superior in quality to any other country to what are we then to attribute this superiority ? why, entirely to the excellence of our mechanical works, and the facility afforded by machinery.

This subject naturally expands itself into a wide field

of facts, circumstances and arguments ; as much might be said of many other arts as of the woollen manufactures, and the same reasonings would be found to bear in support of machinery. Indeed, there are innumerable instances, if we take but the trouble of looking round us, in which machinery has produced new articles of very general demand, and created wants which could be supplied by no other means.

We should have pursued this argument in connection with several other branches of the arts, but it would have been for the most part a repetition of cases coinciding with what has been already said, we therefore close our remarks for the present, by copying part of a small, well-written pamphlet, which has just issued from the Society for Diffusing Useful Knowledge, in which many very correct and valuable remarks are made upon machinery and its effects, as an address to the working classes.

“ You appear to have contracted a great dislike to the use of what are termed machines, and chiefly to the use of thrashing machines. You have never well considered the reason of your dislike. You merely state, that machines are hurtful to labourers ; that they prevent the poor being employed. Upon these grounds, you proceed to destroy them.

“ The word **MACHINE** seems to convey to your minds some contrivance necessarily attended with mischief to the poor ; whereas, in truth, the word **machine** means the same as **tool** or **instrument**, on all occasions has the same signification. A thrashing machine is a tool or instrument with which we thrash ; so is a flail, only that it is a far less useful machine.

“ You must remember, that the Almighty has sent man into the world furnished, as far as the make of his body is concerned, with less means of providing sustenance for himself, than any other animal it has pleased Him to create. All other animals early, indeed, soon after their birth, provide for themselves ; the care of the parent ceases, and each individual amongst them depends on his natural powers for support.

“ But this bodily weakness of man is amply and fully made up to him, and the defect supplied by the reason, intelligence and invention, which God has bestowed on him.

“ Man, when thrown into the world in this state of weakness, begins, as soon as he feels his wants and the necessity of finding food, to look about for tools, instruments or machines, to assist him in cultivating the soil, the common mother of all his comforts. He first invents the most simple tools ; the hoe, the spade, the rake, the axe, the flail, the last of which is a machine, which requires much experience to use with effect ; but before he can obtain these machines or tools in the perfection in which we now use them, he must have discovered iron, the art of melting it, of casting it, and, when so cast, reducing it again into hard, soft, or brittle metal, according to the uses for which he destines it.

“ As men by experience and practice extend their knowledge further, they contrive other machines, instruments or tools ; they make the wheel, the cart, the plough ; all of which are intended and used to ease his toil and abridge his labour. If these instruments did not produce this effect, men would reject them as useless and unprofitable.

“ Further experience and practice lead to further contrivances, but they are always made with the same object in view, that of decreasing our bodily toil and increasing our comforts. Men have invented the complicated machinery of mills, thrashing machines, and steam engines ; and these are used because they tend to increase not only the comforts of him who uses them, but of him who purchases the articles and necessities of life which these machines prepare for market, and consequently for the whole community. Whatever tool, instrument, or machine lessens the quantity of labour required to prepare any commodity or article, renders it cheaper in the market, and more within the reach of every person who desires to buy it ; and, of course, as labourers are buyers, they profit by the cheapness. This is proved by the following plain and simple reasoning.

“ The price which must be paid for any article which is bought, is always equal at least to the cost or price of the labour bestowed upon it. The labourer must be paid for his work, and this payment to him makes a part of the

price asked for the article to be sold. An article which requires the labour of two men to make it, must cost twice as much as one which requires the labour of a single man only ; but if a person, by the invention of some machine, tool, or instrument, can make, with the assistance of such machine, an article, which before the invention took the labour of two men, he can afford to sell it for the price of the labour of one man, and a part of the price the machine so invented cost him ; and as these tools often last a long time, a small portion of that price is sufficient. Now these plain truths apply equally to the most simple and the most complicated machines or tools.

“ Take the example of a carpenter. By the assistance of his saw, his axe, his planes, his chisels, of the best sort and construction, he will do as much work as two men can do with worse tools, and ten times as much as ten men could without any machine or tools whatever. When Peter the Great was endeavouring to civilize his Russian subjects, he found that they had no other way of splitting their trees into deals, except by the axe, which wasted their labour and their timber, and made very clumsy planks. He introduced the saw, by laying a tax upon deals cut with the axe ; and though the first year brought a large revenue from the impost, the next year it fetched little or nothing, all men using the saw, which they found an immense saving of both work and wood ; and the poor Russians, though very uncivilized and ignorant, had the sense to see that all the people gained by the change, because all got their deals cheaper and better ; therefore they never dreamt of complaining that the saw threw hands out of employment. Now, suppose a labourer should go to a carpenter working with machines or tools of the best construction, and say to him, ‘ These tools prevent the labourer being employed, and you shall use worse tools, and take another hand to help you ;’ would not the carpenter answer to the labourer, ‘ you are a madman ! I can sell you the articles you want cheaper, and I make them cheaper than if they required two men to make them. It is not the interest of you or of any individual to destroy my tools, and if you attempt it, and I can resist your attempt by force, I will do it ; if I cannot, and am obliged to yield to your lawless and cruel endeavour to injure me and yourself, I will seek my remedy against you at the hands of justice.’

“ Now remember, labourers, there is no difference between the case of the labourer who breaks the thrashing machine of the farmer, and that of the labourer who destroys the tools or machines of the carpenter. The injustice is equal in both cases, although the consequences are more striking in the case of the farmer, from the greater value of machines destroyed, and the greater injury sustained by the numerous individuals who depend upon the farmer for a supply of corn. When the farmer has cut his corn and housed it, the grain must be separated from the chaff and straw; you would not, surely, desire to rub it without your hands, though certainly that would take more labourers. Some machine or instrument must be used to thrash it out. Why should not the farmer be permitted to use the instrument which will do this work most readily and effectually—which will do it at the least cost, and enable him to send the corn to market, to be sold at the lowest price ?

“ Your clothes, your stockings, your shirts, are all made by machines, far more curiously contrived than the thrashing machine. The calico which makes your shirts, is woven by a machine, attended only by a girl; but in consequence of the little labour required to manage it, the shirt which formerly cost seven shillings, now costs only eighteen pence.

“ It is undoubtedly true, that all machinery which spares human labour, unavoidably, on its first invention and on beginning of its work, throws some persons out of the employment in which they had been engaged, and they must seek their means of support in some other way; this is the necessary consequence of the introduction into use of the most simple instrument, and of all improvements in art. But on the whole, the public, and every individual in it, are in the end infinitely the gainers. In following the course you are now pursuing, you are driving men back to their savage state, when they lived upon acorns and roots, and had no machines nor tools at all, a great demand for labour, and very little to eat.

“ The object of this address is to point out to you, that the breaking of machinery will not remedy the evils of which you complain. You will soon deeply repent of your projects and your acts. You will find that corn will rise in price, in proportion to the increase of labour bestowed in bringing it to market.

“ The outrages you have committed are equally dis-

graceful and injurious to yourselves, and must, in combination with the still more horrible crime of burning—spread famine and desolation through the land. Your sufferings cannot be relieved by such acts; you will heap on your own heads, on your children, your families, and the rest of your fellow creatures, evils which when they arrive will terrify the stoutest hearts, and fill with repentance and remorse the boldest of your leaders.

“ It is true that the number of labourers exceed the means which can be found for their employment; and in this excess lies the real cause of the present distress amongst you. It has been brought on by a train of circumstances, for which the present generation are not answerable. But the remedy will not be found in employing two men to do that which can be done, and better done, by one. The best relief will be found in the fervent and anxious desire, which is now felt by landlords and their tenants, to make every sacrifice in their power to support and comfort those, for whom constant employ cannot be obtained, and to pay those who are fully employed, a sum amply sufficient to purchase the necessaries and comforts of life. An increase of trade, commerce, manufactures as the country prospers, will cause an increase in the growth of corn, to supply the food of those who labour in manufactories; fresh mouths to feed will require more food for their use, and take up the labourers who are now unemployed in the fields.

“ One other remark shall close these observations; and it is addressed to the whole community as well as the labourers, but it interests the labourers most of all. The use of thrashing machines saves exactly one-tenth part of the grain. One-tenth part is five weeks' consumption of the kingdom, and makes all the difference between a good and a bad harvest—between a dear and a cheap year. Whoever breaks these machines, therefore, does as much harm to the country as if he made a dearth in it.

“ A few years ago, when there was a full demand for labour, thrashing was considered as the most irksome kind of labour. It may now be said in defence, even of the much abused thrashing machines, that the farmer can employ the whole number of his labourers under shelter on wet days; whereas when he thrashes by the flail, two or three men are constantly at work under shelter even in dry weather, and there is no room to admit more, no comfortable work for the whole number in bad weather.”

## AMERICAN PATENTS.

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For an improvement in Horse Shoes; Sumner King, Sullivan, Madison county, New York.

THE improvement designated is the making the caulks, or projections, moveable, instead of permanent; for this purpose the shoe is to be formed with an opening or mortise in the toe to admit the moveable caulk to slide in, when it is to be secured by a bolt, or screw and nut. "The hinder caulks may be fastened on in the same way, or they may be permanent."

"The caulks can be cast, or made of steel or iron, or any other metal."

"What I claim as my invention, is, the making of moveable caulks, or projections, for horse shoes, whether made of cast or wrought iron, or of any other metal as above described."

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For a tool called a Screw Swedge, for Cutting or Forming the Screw Thread in Brass, Iron, Steel, or other Metal; Richard Whitney, Baltimore, Maryland.

This patent is taken for the forming of screws on "common screw-bolts, wood screws, and all other purposes for which it is necessary that the screw thread be cut thereon; and an easy method of forging the nuts to be used with said screws after they are thus formed, or made in the old way, with a plate; the aforesaid tool answering all the purposes of common screw plates now in use."

The tools for which this patent is taken are very clearly described, and distinctly represented. There must be a pair of swedges made, one of which may fit into the eye of the anvil, as usual; the upper swedge should have a proper handle and a guide to insure its standing correctly over the lower. In each of these swedges one-half the intended screw is to be sunk just as they are in the dies in screw stocks. The heated metal is to be placed between

these, and the screw formed in them by forging. The thread may be angular, or square, as may be desired.

For some purposes this contrivance will undoubtedly answer, but it must be for very common purposes. The stretching, or lengthening of the screw, produced by the common stocks, and especially by the screw plate, which is so injurious to those screws which are intended to work in deep nuts, will be produced in a much greater degree by the proposed plan, excepting in those instances where the length of the screw is not greater than that in the die.

To talk of forging screws of brass in such tools may do for one who has never essayed the working in that metal; we are assured that no worker of brass will violate this part of the patent. We know that screws might be so cut upon small, cold, brass wire, but we also know that it would be very far from an improvement.

The method prescribed for forging the nuts, is to make them in the usual way, punching the hole sufficiently large to pass over the tap, then to heat them, and forge them on the tap, by striking carefully on their square edges, so as to bring up the thread. Such nuts, if they are to be neatly finished, will require more labour in filing their sides than would have been necessary to cut a good screw with a tap.

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For an improvement in the Mode of applying the Common Flyer for Spinning and Twisting, denominated the "Universal Spinner."—John Brown, Providence, Rhode Island.

The spindle in the improved mode proposed, has a bearing at each end, and an aperture at top, for the thread to pass through, similar to that in the common flax wheel spindle. The bobbin has a positive motion given by a whirl at its bottom; the flyer is attached to the upper part of the spindle, and this latter passes through a tube made fast in the waive rail, or lifter, on the throstle frame; it runs quite freely in this tube, being subjected as little as possible to any obstruction, excepting that of the draught of the thread, which is attached to the flyer in the usual way. To regulate the draught with the necessary precision, the lower end of the spindle passes through a notch in a piece of leather, to which a weight may be attached.

"The band which gives motion passes from the cylinder in the frame, to a whirl under the bobbin, on said tube, instead of passing to a whirl on the spindle; neither the whirl nor the bobbin having any connexion with the spindle, excepting in causing the revolution of the flyer and spindle, by the aid of the thread; the flyer being fast is conveniently lifted from its place, with the spindle, for doffing, &c."

There is a fast whirl on the tube, on to which the band may be dropped, and from which it may be raised, by a touch of the finger, when piecing is to be effected.

The claim is to the "peculiar application of the flyer and bobbin, as above."

For an improvement in the Spindles used in Spinning, and in the Throstle Frame. Benjamin Brundred, Oldham, Bergen county, New Jersey.

Three different modes of constructing spindles are described, and claimed as new; the description is very clearly given, by the aid of a well executed drawing. They are all fixed, or still spindles. In the first, a brass tube is fitted upon the spindle, extending down to the bobbin lifter, and upwards about two-thirds of the length of the spindle. On the lower part of this tube is a whirl by which it is turned, and on the upper part the bobbin is fitted. The upper end of the spindle is hollow, being drilled down to the depth of two or three inches; a small spindle fits and turns in this drilled hole, having flyers attached to its upper end. The operation of this spindle need not be described to those who are familiar with such machinery. The two others are different modifications of this spindle which are ingenious, but more complex than the former.

The improvement in the throstle frame consists in extending arched pieces from the extreme supports of the frame, to sustain it on the floor, instead of the many legs upon which it usually stands, subjecting the machine to derangement from the sinking of the floor in any part,

The claims are to the various modes of constructing the spindles, and to the arched supports of the throstle frame.

For an improvement in the Manufacture of Pasteboard, Band-box Paper, Bookbinders' Boards, and all other kinds of brown paper. Isaac Sanderson, Milton, Norfolk county, Massachusetts.

This patent is taken for manufacturing the above named articles from salt meadow grass, of various kinds, first made into hay, and prepared by using lime water, potash, and train or spermaceti oil. The patentee does not, however, claim either the use, or the mode of using the foregoing articles, and says, "but what is claimed as a new invention, or discovery, by me, is the making of brown paper entirely, or chiefly, from salt hay boiled and prepared as aforesaid."

For an improvement in the Bedstead as inclosed within, or attached to Presses, Bureaus, Sofas, &c. denominated the "Secret Bedstead." Williams Wooley, City of New York.

The bedstead above named is made to fold up in a manner which resembles the leaves of a common dining table, supposing the table inverted. The sacking bottom is fastened to two strips which drop into notches, or mortises, in the frame. The bottom part of the bedstead is upon castors, or rollers, upon which it is run out of the press when the doors are opened. Two levers, one at each end of the press, connect the bedstead and press together, one end being attached to the press, and the other to the bedstead, by pins, so as to form a joint.

The specification does not state in what the improvement consists, but merely describes the whole bedstead, without any claim: if the patent can be sustained, therefore, it must be limited to the particular arrangement of the parts as specified.

For machinery for bending waggon-wheel and other tires. Lester Butler and Isaac Hinkley, Cobleskill, Schoharie County, New York.

The whole of the specification is comprised in the following words:

"Instead of having the bed and notch pieces, on which the under rollers run, stationary, and the rollers varied by

moving them on said notches, which are an inch or more apart, as those in use are, the under rollers are regulated by placing them on slides, with one notch on each slide, which are moved by means of a screw on each end of the bench or platform, on which the slides and rollers are placed. By this method, the under rollers may be varied so as to bend to any diameter you please."

The drawing affords little or no aid in explaining the machine; the general nature of the improvement, it is true, may be collected from the above brief description.

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For an improved mode of taking the Figures of Ingrain Carpets from the Cloth. William Sherwood, Somersworth, Strafford county, New Hampshire.

This improvement will best appear by comparing it with the old methods. First. Figures have been taken from the cloth by the tedious operation of counting the threads. Second. They have been taken by copying the figure upon design paper, and then placing the paper against a reed, the splits of which correspond with the design, a simple having been previously drawn through each split. The figure is then picked up by the simples, where the paper is painted. In my improvement no reed is used, but a loop is made in the end of each simple, and the cloth being wound upon a roller, or beam, the filling is taken out of the centre of the figure. The changes of warp which make the ground of the carpet, are drawn through the loops, and wound upon another beam, which brings the cloth in a horizontal position, and the threads of warp which make the figure are cut off close to the cloth. A wire is then run into the place of the centre thread of filling, which makes the figure, and when shoved back against the simples it separates the two parts required. The centre lash, or change of the filling, is then drawn out, and the next lash is taken in the same way, and so on, until the figure is completed.

Instead of drawing the threads of warp, which make the ground, through the simples, as above described, those threads which make the figure may be taken for

that purpose ; in which case the changes must be made by the filling of which the ground is composed, or a wire put in its place.

What I claim as my specific invention, is the connecting the threads to the simple.

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For an improvement in the Bee Hive ; Ebenezer Beard, Charlestown, Middlesex county, Massachusetts.

The hive recommended is a double, square hive, one compartment being placed upon the other, with a division between them. In the upper division there may be four different compartments, formed by four separate boxes, which are placed with their mouths downwards. The communication between the upper and lower compartments may be opened or closed by means of slides ; they are left open until the bees have filled a box with honey, when the slide is closed, and the bees within the box confined there ; after " a few hours the bees in the box will become tame and harmless, in consequence of being shut out from their queen. The box may be then removed by lifting it out of the chamber, and setting it by, inverted ; the bees will return to the hive, the box may then be emptied and replaced, the slide drawn out, and the work proceed as at first.

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For an improvement in the manufacture of Hats, consisting in the stiffening thereof ; Samuel W. Williams, Elizabethtown, Essex county, New York.

The process employed is similar to that now extensively used, in which shellac is dissolved in an alkali, applied to the hat in this state, and the alkali neutralized by the sulphuric acid. In the present instance, however, copal and resin are added in certain proportions, and it is said that this plan is more economical than that generally followed. The claim is to the adding these two resins ; the mode of combining them ; the relative proportions in which they are used ; and to the mode of applying the stiffening.

## APPENDIX

To the Report of the Select Committee of the House of Commons, on Patents.

Papers delivered in by John Farey, Esq.

[*British Law of Patents for Inventions.*]

**MERCHANT** Strangers (being no enemies) coming into this realm, shall be well used. All merchants (if they were not openly prohibited before) shall have their safe and sure conduct, to depart out of England, to come into England, to tarry in, and go through England, as well by land as water, to buy and sell, without any evil tolts ; except in time of war.—*Magna Charter, 1225. 9 H. III. s. 1. c. 30.* confirmed by 1382. 5 Ric. II. stat. 2. c. 1.

All staples shall cease, and all merchants may come in, and go out, with their merchandize, without any disturbance.—The staples beyond the sea and on this side, ordained by kings in times past, and the pains thereupon provided, shall cease. All merchants, strangers and privy, may go and come with their merchandizes out of and into England, after the tenor of the Great Charter.—1328. 2 Edw. III. c. 9.

Merchant strangers may buy and sell within this realm, without any disturbance. All merchants, strangers, and denizens, and all others, of whatsoever estate or condition, that will buy or sell corn, wines, aver de pois, victuals, wares, and all other things vendible, from whencesoever they come, by foreigners or denizens, at whatever place it be, may freely sell, to whoever they please, foreigners or denizens ; except the King's enemies. Notwithstanding any charters, usages and customs to the contrary, for the same are to be held of no force, but as things granted to the damage of the King, and the great men of his realm, and to the oppression of the commons ; saved always to

the King the customs due on the merchandize.—1335. 9 Edw. III. s. 1. c. 1. enforced by 1350. 25 Edw. III. stat. 4. c. 2. also confirmed by 1353. 27 Edw. III. stat. 2. c. 2.

All merchants (being no enemies) shall come into the realm, and depart quietly. The provisions of the Great Charter are confirmed ; saving reasonable customs and subsidies to the king, and free customs granted to the City of London, and to other cities and towns.—1340. 14 Edw. III. s. 2. c. 2.

Fiftieth Edward the Third. John Peachie, of London, was severly punished for procuring an exclusive license under the Great Seal, that he only might sell sweet wines in London. Coke's Institutes, part 3, chap. 85, against Monopolists.—1376. Rot. Par. nu. 33.

No lands shall be granted by Letters Patents, until the King's title be found by inquisition, duly made according to 8 Hen. VI. c. 16, and 36 Edw. III. c. 13.—1439. 18 Henry VI. c. 6.

Confirmation of Letters Patent, made by Edw. IV. to several persons, of offices.—1461. 1 Edw. IV. c. 1.

An Act for Grants, made by King Edw. IV. since the first year of his reign, *exp.*—1467. 7 Edw. IV. c. 4.

A Patent was granted by King Henry the Seventh, to John Cabot, a Venetian, to go upon discovery of new lands in America, under English colours. In 1502, another such patent to Johna Gonzales. Also, in 1506, a patent to an Italian, for making Alum, a new art which had been recently established in Italy.—1496.

An Act annulling second Letters Patents of Grants during the King's pleasure, making no mention of the first Letters Patents for the same things. Any person making suit to the King, for grant of any lands, offices, or other things before granted to any other during pleasure, (the first patentee being in life) shall express in his petition or patent, the tenor of the former patent, and in what maner the King hath determined his pleasure against the said first patentee ; or else the second letters patent shall be void.—1514. 6 Hen. VIII. c. 15.

An Act for making cables at Burport, in Dorsetshire, but not within five miles thereof. Also, in 1533, 25 Hen. VIII. c. 18, for making woollen cloth at Worcester city, exclusively of the adjacent country.—1529. 12 Hen. VIII. c. 12.

An Act concerning clerks of the signet and privy seal, and the offices and fees connected with, and incident to, royal grants by letters patent, or closed.—1535. 27 Hen. VIII. c. 11.

(a) Every grant made to any person by the king, in writing with his sign manual, before being passed under any of his

Grace's great seals, shall be first delivered to the King's principal secretary, or to one of the King's clerks of the signet. (b) The latter shall, within eight days after receiving such bill, so signed with the king's hand, make out and sign letters of warrant in the king's name, and sealed with the king's signet, to the lord keeper of the king's privy seal; and after due examination of such warrant by the said lord, one of the king's clerks of the privy seal, shall, within eight days after receipt of that warrant, make out and sign other letters of like warranty to the Lord Chancellor, or other keeper of the king's great seals, for the writing, and sealing with such seals as remain in their custody, of letters patent, or closed, according to the tenor of the warrant to them directed as aforesaid, from the officer of the privy seal.\* (c) Any person writing warrants or procuring grants under any of the great seals, after any other fashion than as before specified, shall forfeit 10l. for every bill passed contrary to the order hereinbefore prescribed: one half of the penalty to the king, and the other half to him who shall first sue for the same.

(c) The fees payable, and the mode of receiving, and accounting for them, is also regulated.

(d) The Lord Chancellor may, at his discretion, pass any thing by the great seal, and deliver the same, without paying any fees at the great seal, signet and privy seal.

In the 30th of Henry VIII. The manner of casting pipes of lead, for conveyance of water under ground, was first invented by Robert Brock. He was one of the King's Chaplains. Robert Cooper, goldsmith, made the instruments and put the invention first in practice.—1538.

In the 35th of Henry VIII. The first cast-iron pieces of Ordnance that were ever made in England, were cast at Backstead in Sussex, by Ralph Page and Peter Baude. The art of casting cannon in brass had only been recently established in England, about 1535. Cannon had been first used by the English by Edward III. at the battle of Cressy in 1346; and in 1383 by the Governor of Calais, but were not used in England till the siege of Berwick in 1505, and after that they became common.—1543.

An Act for the confirmation of Letters Patent, notwithstanding the misnaming of any name, place or date contained in the same, *exp.* : See also 7th Edward VI. c. 3, and 35th Eliz. c. 3,

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\* Note.—The proper date for such letters patent or closed, is not fixed, but is provided by 18 Hen. VI. c. 1.

(chiefly on grants of Church lands)—1542, 34 and 35 Hen. VIII. c. 21.

A Bill for confining the making of Coverlets in Yorkshire to York City.—1542. 34 and 35 Hen. VIII. c. 10.

An Act for the confirmation of Letters Patent, notwithstanding mis-recitals, or lack of inquisitions, or of certainty in valuing, *exp.* Note. This Act appears to avoid the previous provisions of 1st Hen. IV. c. 8, and 18th Hen. VI. c. 6.—1547. 1 Edw. VI. c. 8. *exp.*

An Act concerning Grants and Gifts made by Patentees out of their Letters Patent. The enrolment of patents is to be received in evidence, by showing an exemplification or constat of the roll, under the great seal, which shall be as good as showing the first patent itself.—1549. 3 and 4 Edw. VI. c. 4. extended by 13 Eliz. c. 6.

An Act for confining the making of Felt Hats in Norfolk to Norwich and Pulham.—1552. 5 and 6 Edw. VI. c. 24.

An Act for the confirmation of Letters Patent of Bargains and Sales, by Hen. VIII. and Edw. VI. notwithstanding mis-recitals of the particulars, *exp.*—1553. 7 Edw. VI. c. 3.

An Act for the confirmation of Letters Patent made by the King and Queen, *exp.*—1557. 4 and 5 Phil. and Mar. c. 1.—Note. A Patent was granted in the reign of Philip and Mary to the Corporation of Southampton, for the exclusive importation of Malmsey wine at that place. This was set aside in the 2d and 3d Eliz. by all the Judges, as being contrary to statutes (viz. Magna Charta; 9th Edw. III.; also 14th, 25th, 27th and 28th Edw. III.; 2d Ric. II. c. 1, and others,) and against the freedom of trade.—Coke's Institutes, part 3, c. 85.

An Act that the exemplifications, or constat of Letters Patent, shall be as good and available in Law as the Letters Patent themselves. A supply of the 3d and 4th of Edw. VI. c. 4; and is extended to all patents since Hen. VIII.—1570. 13 Eliz. c. 6.

Bircot's case, decided at law in the Exchequer Chamber, 15th Elizabeth, Easter Term. A privilege concerning the preparing and melting, &c. of lead ore.—1572.

“A privilege, to be consonant to law, must be for what is substantially and essentially newly invented; if the substance was in being before, and a new addition made thereunto, though that addition make the former more profitable, yet it is not a new manufacture in law. It was there said, that that was to put but a new button to an old coat, and it is much easier to add than to invent; it was also there resolved, that

if the new manufacture be substantially invented according to law, yet no old manufacture, in use before, can be prohibited." This case was cited during the trial Boulton and Watt against Bull, in 1795, by Mr. Justice Buller, who said, " It has never been directly decided that a patent for an addition may be maintained ; but if the button were new, I do not feel the weight of the objection, that the coat was old ; in truth, arts and sciences at that period were at so low an ebb, in comparison with their present state, that I do not think that case ought to preclude the question." And by Lord Chief Justice Eyre, who said, " The principle on which that case was determined has not been adhered to." Also cited during the trial of Hornblower against Boulton and Watt in error, 1799, by Mr. Justice Grose, who said, " If that decision were to be considered as law at this day, it would set aside many patents for very ingenious inventions, in cases where the additions to manufactures before existing, are much more valuable than the original manufactures themselves. Lord Coke's opinion seems to have been formed without due consideration, and modern experience shows that it is not well founded."—Coke's Institutes, 3d part, c. 85.

**An Act for confirmation, as well of all Grants made to the Queen's Majesty, as of Letters Patent made by her Majesty to others.—1576. 18 Eliz. c. 2.**

A patent was granted by Queen Elizabeth, for printing a book. Printing began in England, 1474.—1591.

An act for explanation of a statute made in the 34th year of King Henry VIII. as well touching grants made to his Majesty, as for confirmation of letters patent made by his highness to others, (chiefly of abbey lands.)—1593. 35 Eliz. c. 3.

**An act for confirmation of grants made to the Queen's Majesty, and of letters patent made by her highness to others.**

Letters patent shall be expounded beneficially for the patentee: patents decreed to be void by act of parliament, or by courts of law; monopolies.—1601. 43 Eliz. c. 1. exp.

A great debate took place in the House of Commons concerning monopolies. It appears from the speeches made on this occasion, that an excessive public grievance then existed, from the multiplication of letters patent for monopolies of almost every branch of trade and manufacture. The following were mentioned, amongst others: salt, aquavitæ, vinegar, alegar, train oil, oil of blubber, brushes, bottles, pouldavy, oade, starch, Irish yarn, calf skins and felts, steel, leather, caids, glasses, saltpetre, &c. &c. There was very little difference of

opinion as to the grievances, for each speaker cited some from his own knowledge; but as to the remedy, they debated whether it should be by bill, or by petition to her Majesty; the latter was adopted.

The following is an extract from the speech of Mr. Francis Bacon, the Attorney-General (afterwards Lord Chancellor Verulam.) "The Queen, by her prerogative, has both an enlarging and restraining power, for she may set at liberty things restrained by statute law, or otherwise, or she may restrain things which be at liberty; for the first, she may grant *non obstante* contrary to the penal laws; for the second, if any man out of his own wit or industry finds out any thing beneficial for the commonwealth, or brings in any new invention, which every subject of this kingdom may use, yet in regard of his pains and travel therein, her Majesty perhaps is pleased to grant him a privilege to use the same, only by himself or his deputies, for a certain time; this is one kind of monopoly. Sometimes there is a glut of things, when they be in excessive quantity, as of corn; or sometimes there is a scarcity, or a small quantity; and accordingly her Majesty gives licence of transportation or of importation: this is another kind of monopoly. These, and divers of this nature, have been in trial at common pleas upon actions of trespass, and if the Judges find the privilege good, and beneficial to the commonwealth, they will allow it; otherwise, disallow it. Since the last Parliament, her Majesty herself hath given commandment to her attorney-general to bring divers of them into the Exchequer; and at least fifteen or sixteen have been repealed, some by her Majesty's own express commandment, upon complaint made unto her by petition, and some upon *quo warranto* in the Exchequer."

The Queen sent a message to the House, importing that the monopolies should be revoked; whereupon an address of thanks was voted; it was delivered to her Majesty by the Speaker, attended by about 180 members, on the 30th Nov. 1601. The following is an extract from her Majesty's answer:—"I never put my pen to any grant but upon pretence and semblance made unto me, that it was both good and beneficial to the subjects in general, though a private profit to some of my ancient servants who had deserved well; but the contrary being found by experience, I am exceedingly beholding to such subjects as would move the same at first."—"That my grants should be grievous to my people, and oppressions to be privileged under colour of our patents, our kingly dignity shall not suffer it; and when I heard of it, I could give no rest to my thoughts till I had reformed it."—1601. 20th November. See Parliamentary History, vol. 4, p. 452.

The case of Darcy against Allien was tried before Chief Justice Popham, (Trinity Term.)—1602. 44th Elizabeth. Year Books, lib. 2. p. 84.

It was on an infringement of a patent recently granted by Queen Elizabeth to Edward Darcy, groom of the chamber, for the importation and manufacture of playing cards. The patent was set aside as a monopoly against both the common and the statute law.

Sir E. Coke says, the judgment given in this case was the principal motive of the publishing of the King's Book (1610,) as is mentioned in the preamble of the Act 21 Jas. I, and that book was a great motive of obtaining the Act to be passed.—See Coke's Institutes, Part 3, c. 85.

A Proclamation by King James I. against Saltpetre-men, who, under colour of the King's Patent, dug up the saline materials in private houses, unless they were well feed to abstain.—1604.

(*To be continued.*)

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## French Patents

GRANTED IN JULY, AUGUST AND SEPTEMBER, 1830.

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- To Peter Joseph Cuvillier, at Nantes, for a tincture to conserve the hair. 5 years.
- Peter Bollen, Maison, for a sieve to extract the flour from potatoes. 5 years.
- Moisson Deswches Satel, Rhodes, for improvements in manufacturing iron. 10 years.
- St. Colombe, Paris, for a machine to grind colours. 15 years.
- St. Chappelle, Paris, for an hydraulic apparatus. 10 yrs.
- Barthelemy Timomuir, St. Etiénne, for a method of sewing stuffs. 15 years.
- Louis I. Auóry, Paris, for a *horgnon montre*. 5 years.
- Peter L. N. Conquérant, Coutances, for improved water cocks. 15 years.

- To Dollin Dufresnch, Metz, for a double carminative body belt. 5 years.
- M. H. Dupargue, Paris, for improved process of burning charcoal. 15 years.
- E. N. Farcau, Paris, for a process to manufacture a certain sort of paper. 15 years.
- John Anthony Favre, Lyons, for machinery to manufacture wire nails. 5 years.
- James Irving, Paris, for a new process to make impurmeable tubes. 10 years.
- A. E. Jaccard, Lyons, for a means to preserve the grease in wheels. 10 years.
- Beuj. Layel, Paris, for improvements in iron rail roads. 5 years.
- Louis, A. Darche, Paris, for some economical heating apparatus. 15 years.
- Galy Cazalate, Versailles, for new steam boat engines. 15 years.
- Louis Bourgignose, Paris, for machinery to cut marble. 10 years.
- Eugene Palmier, Paris, for improvements in manufacturing boring tools. 5 years.
- Bourlet d'Amboise, Paris, for a new heating article called "racahoute." 5 years.
- John Bouval Sr. Paris, for a new process to dress furs. 15 years.
- T. X. Brinmeyer, Paris, for a new instrument called "*dital harpe*." 10 years.
- A. and R. Carrick, New York (represented by Mr. Albert,) for a new water spindle. 15 years.
- Claude Champion, Besancon, for machinery to manufacture bricks. 15 years.
- Christopher Dieudormé, Paris, for a new improved saddle. 5 years.
- Charles Lefevre, Strasbourg, for several processes to manufacture bread. 15 years.
- William Newton, London (represented by Mr. Albert,) for improvements in manufacturing paper hangings. 5 years.
- John Oeckelhaenzer, Paris, for machinery to manufacture paper. 15 years.
- I. H. de Rigault, Paris, for a machine he calls "*air, water and fire*." 15 years.
- Louis Jerome Perrot, Rouen, for machinery to print stuffs. 5 years.
- Francis R. Roux, Avignon, for an economical furnace. 10 years.

To Sorel, Paris, for a new system of steam engines. 10 yrs.

— M. H. Sweeny, London, for a new compound metal for ship linings. 15 years.

— Philip Taylor, Paris, for improvements in manufacturing sail cloth. 15 years.

— Vivant Son, Paris, for a new system of coaches, he calls "impulsive." 10 years.

— Lacombe Son, Paris, for improvements in silk spinning. 5 years.

— Chapuy and Marsaux, Paris, for a static lamp, he calls "Chronometre." 10 years.

— Mrs. Degrand, Marseilles, for an apparatus to filter syrups. 10 years.

— Berdot Lalannet, Paris, for the application of exotic wood to dress. 10 years.

— J. B. Laignel, Paris, for a process to warm coaches. 5 yrs.

— P. M. Robin, Paris, for a new steam coach. 10 years.

— De Malortie, Rouen, for a colour mill. 15 years.

— Herrisson and Garnier, Paris, for a machine called "pulsometre." 10 years.

— Maurice de Jongh, Manchester (represented by Mr. Albert,) for a self spinning mule. 15 years.

— Cholat Father, St. Etienne, for a process to apply marks upon the silk warps 5 years.

— John Meric, Paris, for a new machine to raise water. 5 years.

— Mathes, brothers, Bordeaux, for a machine to heckle flax, &c. 10 years.

— Camille Pleyel, Paris, for a harmonical table in pianos. 5 years.

— John Francis Godin, Paris, for an improved silos or cistern. 5 years.

— Caillaux, Paris, for improvements in the manufacture of animal black. 5 years.

— Cordier Lalande, Paris, for a new lamp "oléostatique." 5 years.

— Isaac Winslow, Havre, for improvements in spinning machinery. 5 years.

— Charles Heiddoff, Paris, for a new inking machine to printers' presses. 10 years.

— F. A. Camus, Paris, for an economical process to heat bakers' ovens. 15 years.

— James N. L'Epine, Paris, for a portable gas apparatus. 10 years.

— Miles Berry, London (represented by Mr. Albert,) for an evaporating apparatus for sugar boiling. 10 years.

To E. Avery Lester, Boston (represented by Mr. Albert,) for pendulem engine. 10 years.

— Auguste Guille, Quinton, for a process to embroider in looms. 5 years.

— Bainest and Pinet, Paris, for a machine to take off the husks of grains. 5 years.

— Dolfus Meig, and Co. Mulhausen, for improved self-moving temples. 10 years.

— Paul Garnier, Paris, for a new escapement in clocks. 5 years.

— Ch. A. Gingembre, Paris, for a steam kitchen. 10 years.

— A. Pauwels, Cit, Paris, (represented by Mr. Albert) for a new propelling machine. 15 years.

— A. H. Renette, Paris, for shooting cartridges. 5 years.

— Van Maarsel, Brussels, for machinery to manufacture nails. 15 years.

— Jean Zuber, and Co. Rishuin, for a machine to manufacture continual paper. 15 years.

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**New Patents Sealed in 1830.**

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To John Revere, of Weybridge, in the county of Surrey, Doctor of Medicine, for his having invented a new and improved method of protecting iron chain cables, iron boilers, and iron tanks, from the corrosion produced upon them by the action of water.—Sealed 27th Nov. 2 months.

To William Church, of Hawood House, in the county of Warwick, Esq. for his having invented or discovered certain improvements in apparatus applicable to propelling boats, and driving machinery by the agency of steam, parts of which improvements are also applicable to the purposes of evaporation.—29th Nov. 6 months.

To Robert Dalglish, jun. of Glasgow, calico printer, for his having invented improvements in machinery or appa-

ratus for printing calicos and other fabrics.—6th December 6 months.

To Henry Blundell, of the town of Kingston-upon-Hull, in the county of the said town, merchant, for his having invented improvements in a machine for grinding or crushing seeds and other leaginous substances, for the purpose of abstracting oil therefrom, and which machine, with certain improvements or alterations, is applicable to other useful purposes.—6th Dec. 6 months.

To Richard Edwards, of Dewsbury, in the county of York, feather and flock seller, for his having invented an improvement on, or substitute for glass, sand, emery, and other scouring paper or substances.—6th Dec. 6 months.

To Samuel Brown, of Billiter-square, in the city of London, Commander in the Royal Navy, for his having invented certain improvements in the means of drawing up ships and other vessels from the water on land, and for transporting or moving ships, vessels and other bodies on land from one place to another.—6th Dec. 6 months.

To John George Lacy, of Camomile-street, in the city of London, gun manufacturer, and Samson Davis, of East Smithfield, in the county of Middlesex, gun lock maker, for their having invented a certain improvement or improvements in the construction of guns and fire arms.—6th Dec. 6 months.

To John Dixon, of Wolverhampton, and James Vardy, of the same place, for their having invented certain improvements in cocks for drawing off liquids.—13th Dec. 2 months.

To Thomas Wamsley, of Manchester, manufacturer, for his having invented certain improvements in the manufacture of cotton, linen, silk and other fibrous substances, into a fabric or fabrics applicable to various useful purposes.—13th Dec. 6 months.

To William Needham, of Longnor, in the county of Stafford, Gentleman, for his having invented certain improvements in machinery for spinning, doubling, and twisting silk and other fibrous substances.—13th Dec. 6 months.

To Samuel Parlour, of Croydon, in the county of Surrey, Gentleman, for his having invented certain improvements on lamps, which he denominates Parlour's improved table lamps.—13th Dec. 2 months.

To John Lee Benham, of Wigmore-street, in the county of Middlesex, ironmonger, in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of certain improvements on shower and other baths.—13th Dec. 6 months.

To Richard Witty, of Basford, in the parish of Wolstanton, in the county of Stafford, engineer, for his having invented or found out certain improvements in apparatus for propelling carriages, boats, or vessels, and for other purposes by the power of steam.—13th Dec. 6 months.

To Bartholomew Redfern, of Birmingham, in the county of Warwick, gun-maker, for his having invented or found out a lock, break off, and trigger, upon a new and improved principle for fowling piece, muskets, rifles, pistols and small fire arms of all descriptions.—17th Dec. 2 months.

To Augustus Graham, a citizen of the United States of North America, but now residing in West Street, Finsbury, in the City of London, gentleman, in consequence of a communication made to him by a certain foreigner residing abroad, for certain improvements in the application of springs to carriages.—17th Dec. 6 months.

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CELESTIAL PHENOMENA, FOR JANUARY, 1831.

D.	H.	M.	II		D.	H.	M.	II	
1	17	0	0	in conj. with $\sigma$ in Leo					lat. 30° N diff. of lat.
2	1	0	0	in conj. with $\epsilon$ in Leo					1° 11'
3	3	0	0	in conj. with $\sigma$ in Leo	17	0	0	0	Stationary
3	11	0	0	in conj. with 1 $\xi$ in Pisces	20	0	0	0	Clock before the $\odot$ 11 m.
4	21	0	0	in conj. with 1 $\gamma$ in Virgo					16 Sec.
5	0	0	0	Clock before the $\odot$ 5 m.	20	5	33	0	$\odot$ enters Aquarius
				33 Sec.	20	7	0	0	$\odot$ in conj. with $\nu$ in Pisces
5	10	54	0	in $\square$ last quarter	20	19	29	0	$\odot$ in $\square$ first quarter
8	15	0	0	in conj. with $\gamma$ in Libra	21	4	0	0	$\odot$ in conj. with 2 $\xi$ in Ceti
9	2	0	0	in conj. with $\psi$ in Libra	23	4	0	0	$\odot$ in conj. with $\chi$ Long. 8°
9	19	0	0	in conj. with $\phi$ in Oph					in Cap. $\odot$ lat. 1° 19' S.
10	0	0	0	Clock before the $\odot$ 7 m.					$\odot$ lat. 37° S. diff. lat. 42°
				42 Sec.	28	3	0	0	$\odot$ in conj. with $\chi$ in Taurus
10	21	0	0	$\odot$ in conj. with $\chi$ long. 9°	23	8	0	0	$\odot$ in conj. with $\nu$ in Cap.
				in Cap. $\odot$ lat. 51° S. $\odot$ lat. 37° S. diff. lat. 14°	23	9	0	0	$\odot$ in conj. with $\alpha$ in Taurus
12	18	0	0	$\odot$ in conj. with 2 $\ell$ Long. 28°	25	0	0	0	Clock before the $\odot$ 12 m.
				in Sagitt. $\odot$ lat. 1° 7' S.					36 Sec.
				2 $\ell$ lat. 23° S. diff. of lat. 44°	27	14	33	0	Ecliptic oppo. or $\odot$ full moon.
13	0	0	0	in conj. with $d$ in Sagitt.	29	14	0	0	$\odot$ in conj. with $\delta$ in Leo
13	13	27	0	Eclip. conj. or $\odot$ new moon	30	0	0	0	Clock before the $\odot$ 13 m.
13	21	0	0	$\odot$ in conj. with $\delta$ in Cap.					35 Sec.
15	0	0	0	Clock before the $\odot$ 9 m.	30	3	0	0	$\odot$ in conj. with $\gamma$ in Cap.
				38 Sec.	30	5	0	0	$\odot$ in conj. with 2 $\beta$ in Cap.
15	2	0	0	$\odot$ in conj. with $\delta$ Long. 12°	30	13	0	0	$\odot$ in conj. with $\sigma$ in Leo
				in Cap. $\odot$ lat. 1° 44' N.					$\odot$ in conj. with $\delta$ in Cap.

The waxing moon  $\odot$ .—the waning moon  $\square$

METEOROLOGICAL JOURNAL, FOR NOV. AND DEC. 1830.

1830.	Therom.		Barometer.		Rain in inches	1830.	Therom.		Barometer.		Rain in inches
	Hig.	Low	High.	Low.			Hig.	Low	Hig.	Low	
<b>Nov.</b>											
26	41	23	30,10	29,89		11	40	30	29,25	29,18	
27	43	31	29,85	29,64		12	39	26	29,83	29,81	
28	46	34	29,56	29,46	375	13	35	26	30,14	30,06	
29	45	37	29,92	29,71		14	41	22	30,32	30,20	
30	45	40	29,86	29,85		15	39	28	30,36	30,28	
<b>Dec.</b>											
1	43	38	29,95	29,83		16	36	26	30,26	30,23	
2	40	36	29,84	29,66		17	37	20	29,99	29,96	,15
3	40	34	29,56	stat.		18	35	28	30,09	30,04	
4	40	34	29,74	29,63		19	39	27	30,98	29,66	,05
5	43	35	29,71	29,46		20	43	39	30,85	29,40	
6	48	33	29,14	29,10	,05	21	40	32	29,76	29,60	
7	48	44	29,14	29,19		22	49	36	29,54	29,34	
8	46	40	29,16	stat.		23	33	28	20,46	20,36	
9	49	40	28,94	28,90	,35	24	25	14	29,30	29,30	
10	42	39	29,16	28,96	,925	25	24	85	20,34	stat.	

Edmonton.

Charles Henry Adams





THE  
**London**  
**JOURNAL OF ARTS AND SCIENCES.**

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No. XXIX.

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[SECOND SERIES.]

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**Recent Patents.**

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*To WILLIAM CHURCH, of Birmingham, in the county of Warwick, Gentleman, for his having invented certain improvements in Buttons, and in the machinery or apparatus for manufacturing the same.—[Sealed 26th March, 1829.]*

THE subject of this patent for making buttons is an improvement upon a former invention communicated by the present Patentee to Thomas Tyndall, gentleman (see Vol. III. of our present Series, page 126.) In the former instance it was proposed to manufacture a peculiar kind of button, resembling the ordinary silk buttons used on men's coats ; which object was effected by the rotation of a shaft, that actuated all the parts of the mechanism for collecting and combining the materials, and discharged the button in a finished state.

Highly ingenious as this apparatus must have appeared to every inspector, yet there were parts possessing considerable complication, which rendered the performance of the machine less complete, and more easily deranged than was consistent with its certain and effective operation. To remedy these defects, to improve the articles produced, and to simplify the mechanism, has been the object of the inventor, and these he has accomplished with great ingenuity in the machine we are about to introduce to our readers, in which the general construction is nearly the same as in the former, but the details of the mechanism, and their mode of acting are considerably different. The following is the

#### SPECIFICATION.

" My improvements in buttons, and in the machinery or apparatus for manufacturing the same, consists in certain variations from, and additions to, a contrivance and apparatus for making buttons, for which (in consequence of a communication made by me when residing abroad,) a patent was granted to Thomas Tyndall, of Birmingham, Esquire, dated the 4th day of December, 1827, a specification of which was duly enrolled in the office of the Rolls Chapel, and to that specification I refer, as exhibiting the principles on which I manufacture buttons. My present improvements on the former machine consist of the following particulars ; viz. 1st, in the mechanism and method by which the shells or foundations of the buttons are prepared ; 2nd, in a mode of making a new kind of shank for the backs of buttons ; that is, the machinery or apparatus for forming the said shanks ; 3dly, the contrivance by which the florentine, or other material for covering the face of the button is conducted into the machine ; 4thly, the apparatus for gathering in

the edges of the florentine over the shell previously to attaching the shank piece ; and, 5thly, the mode by which the wheels are driven, that carry the several parts of the button, for forming it and putting it together ; the particulars of which said improvements, are fully set out in the drawings hereto annexed, and will be clearly understood by the following description thereof : the similar letters of reference pointing out corresponding parts in all the figures.

Plate X. Fig. 1, is a front view of the complete machine for making buttons with the present improvements attached, fig. 2, is an end view of the same, taken at the left hand of fig. 1. The power by which the machinery is to be driven, must be applied to the horizontal shaft A, A, which may be by hand or by a rigger and band from a steam engine, or other first mover, and governed by a fly-wheel.—Upon the said shaft, a bevel wheel B, is fixed, taking into a similar wheel C, at the lower end of the short vertical shaft D, having a crank E, at its upper extremity. From this shaft D, arises the impelling power, which actuates the carriages that feed in the materials of which the button is to be constituted.

“ On the top of a sliding standard, F, is mounted a pair of spring claws G, which are intended to hold the sheet of thin metal, that the shells or foundations of the buttons are to be made from ; by the action of cutting discs in the manner hereafter described. Another sliding standard H, carries a similar pair of claws I, holding the sheet of metal, out of which the other discs are to be cut for forming the shank pieces, that is, the back part of the button and its shank. At the opposite side or back of the machine represented in fig. 3, the roller K, is placed carrying the florentine or other material, for covering the

faces of the buttons. This roller is suspended on pivots bearing in the sliding frame L, L.

“ A representation of the parts of the mechanism laying on the table of the machine, is shewn in the plan or horizontal view, at fig. 4, which will explain the movements of the several racks, pinions, and catches, connected with the feeding apparatus, above alluded to.

“ The rotation of the crank E, causes the lever o, (see fig. 4) to vibrate, which moves the catch p, to and fro, and this catch taking into a rack q, affixed to the sliding frame or carriage L, at every stroke of the lever, moves the rack q, and also the sliding frame L, the distance of one tooth. The sliding of this frame, causes the rack r, affixed to it, to drive a pinion, s ; at the back end of the shaft t, which shaft (though represented broken in fig. 4,) crosses the table of the machine, and has two other pinions attached to its opposite extremity, severally taking into the racks v, and u, fixed to the sliding plates, to which the standards f, and h, with the feeding apparatus, are attached.

“ Thus it will be perceived that the rotation of the crank E, through the intervention of the lever o, and pall p, moves the sliding bar L, for feeding in the florentine, and this sliding bar by its rack r, drives the pinion and shaft s, t, which by means of the pinions and racks v, u, moves the feeding apparatus for supplying the two sheets of metal, out of which the shells, and also the shank pieces of the buttons are to be made.

“ Let it now be supposed that the sheet of metal for forming the shells is held in the claws g, and passed through the slit of the punch box w, where the disc is to be cut out. In a similar way the other sheet of metal for making the shanks is held in the claws i, and passed

through the slit in the punch box x, for the same purpose.

“ The constructions of the cutters, for punching out the discs for the shells and for the shank pieces being similar, though slightly different in size, are shewn in section, in the detached figure 5; a, is a pin passed through the lever b, and through the standard c, fixed on the plate d, seen in fig. 2.

“ To one end of the lever b, is attached the rod e, which rod extends downwards, and is connected at bottom to the tappet lever f, hanging in the staple g. This lever f, is acted upon by the cam wheel h, on the main shaft A; hence, as the cam h, goes round, the tappet lever f, is raised, which lifts the rod e, and the tail of the lever b, and thereby depresses the punch at the reverse end of the lever, by which means the disc of metal is cut out of the plate.

“ The particular construction of this punch is shown by the sectional figure 5; w, is the punch box before mentioned, in which there is a slit for admitting the sheet of metal edgeways. The cutting punch i, is a cylindrical tube of steel, which being depressed by the action of the lever b, in the manner above described, punches or cuts out against the lower cutter j, a disc from the metal sheet; which disc by the cutter is forced down into the recess of j. There is a plunger k, acting within the cutting tube i, which is connected to a lever l, mounted on an axle in the standard c; the reverse end of this lever l, is attached to a rod m, passing down within the rod e, to the cam h, where a tappet lever, similar to f, and working within it, is acted upon by the cam directly after the disc has been cut, and causes the punch to push the disc through the recess k, or drawing block j, and turn up the edges, (technically called drawing through) and de-

posit the shell thus formed in one of the recesses of the carrying wheel *n*

“ The discs for the shank pieces, which are not quite so large as those for the shells, are cut and drawn through by similar means to those last described. The punch box for cutting the shank pieces, is shewn at *o*, in figs. 1 and 2, and *p*, is the hollow rod, carrying the cutter with the plunger within, which are actuated by the tappet levers *q*, worked by a corresponding cam wheel on the main shaft. These discs are also deposited in one of the carrier wheels *r*, ready to be conducted through the machine, for the further manipulation of the button, as described in the former specification.

“ Fig. 6, represents the system of carrier wheels, as seen horizontally detached from the other parts of the machine, of which there are two more than in the former invention, *n*, and *r*, designed as above said, for receiving and conducting the shells and shank pieces. These carrier wheels are mounted on a vertical shaft, and driven by toothed gear below.

“ In my present method of forming the shank of the button, the shank piece is conveyed to the several punches by the carrying wheels, as in the former specification.— Supposing the shank piece to be deposited in the carrier wheel *r*, at the hole No. 1, after three movements of the machine, it will arrive at the situation of No. 4, which is immediately under a hole in the wheel *s*; at this time the first pair of dies come into operation, for piercing and raising a cross, which is to form the shank. Representations of these dies are shewn in several figures, partly in section, (one quarter size in the plate.)

“ Fig. 6, shews the first pair of dies, by which the piece of metal is pierced in the form of a cross, and raised spher-

rically. When the shank piece has proceeded on to the next stage, No. 5, a pair of nippers are applied for the purpose of rounding the edges of one of the bars of the cross or shank. These nippers are connected to one of the descending punches, and are shewn detached at fig. 7. The nippers *a, a*, are held within the hollow punch, their chaps being kept open by a spring, until they have embraced the cross *b*, and a wedge piece above them acting between the tails of the nippers, causes them to close and pinch the bar of the shank into a round or wire like form. The wedge piece is depressed by jointed levers, *c, d*, as seen in fig. 8, and are connected to the perpendicular rod *w*, as shewn in fig. 3, which rod is acted upon by the rotatory cam *x*, on the main shaft. The next movement of the machine brings the shank piece to the situation, No. 6, where a similar pair of nippers, actuated by the same levers and rod pinch up the other bar of the cross shank and the finishing touch is given to the shank at the hole No. 7, where the dies fig. 8, are brought into action by the means above stated.

" The mode of working the punches in my present machine, is very similar to that described in the former specification above referred to, that is the upper series of punches are fixed to the upper moveable block *y, y*, and the lower series of punches to the lower moveable block *z, z*, which are slidden up and down, by the side rods connected to the cranks on the main rotatory axle *A, A*, by means of which movements, the corresponding punches and dies, sliding through the guide plates, are brought together for the purpose of giving the required impression in forming and putting together the several parts of the button.

" The discs of florentine, or other materials for covering the faces of the buttons, are cut out of the piece simul-

taneously with the metallic discs, but at the opposite side or back of the machine. The florentine, as before stated, is rolled upon the roller  $\kappa$ , and is passed between the drawing rollers into the slit of the punch box  $y$ , where the cutter, constructed as described in the former specification, is brought down, and made to cut out the disc of florentine, through the agency of the levers and rods  $z, z, z, z$ , at the lower extremity of which is a tappet lever, acted upon by a cam wheel in the centre of the main shaft.

“ It will now be necessary to refer to the former part of this specification, in which the lateral movements of the standards of the feeding apparatus  $F, H$ , and  $L, I$ , are described as being effected by the rotation of the pinions, severally taking into the racks  $v, u$ , and  $r$ , and it will be seen that the sheets of metal for forming the shells and the shanks of the buttons, and also the florentine for covering them, are by those means progressively slidden along through their respective punch boxes, and the discs cut therefrom for the purposes and in the way above described.

“ Let it be supposed that a series of discs have been cut from the end of each of the sheets of metal, and from the piece of florentine, in straight rows, it now becomes necessary to advance the sheets and pieces forward and to traverse them back again, laterally in order to cut another row of discs from each, the contrivance for which is shewn in figs 3, and 4.

“ When the rack  $q$ , has slidden to nearly the end of its range, a tappet, fixed to the rack, comes against an inclined plane on the side of the piece  $f$ , and pushes it into the situation shewn by dots, the object of this movement is, that at the next revolution of the crank  $e$ , the end of the lever  $o^*$ . at  $g$ , may strike against the

end of the piece f, and cause it to throw the three armed lever h, into the situation shewn by dots. This movement of the lever h, allows the spring catch i, to fall into the teeth of the rack q, and at the same time withdraws the spring catch p, from the rack. The rotation of the crank e, in actuating the levers, now causes the rack q, and also the carriage with the florentine, to traverse back again; but simultaneously with the last charge, the tappet e, strikes against an inclined plane on the catch rod k, and presses it back, as shewn by dots, so that as the lever o, vibrates, a pin at its end now takes hold of the hook of k, and draws the catch rod along, which moves the lever and click (l), and causes the ratchet wheel m, to be driven forward one tooth.

“ At the upper extremity of the perpendicular shafts n, to which the ratchet wheel m, is affixed. There is a broad wheel taking into a similar wheel o, on the horizontal shaft (p), extending along the back of the florentine carriage. This wheel o, is confined by a bracket, and allows the shaft p, to slide through it from end to end, being locked together by a feather key.

“ The occasional movements of the shafts n, and p, are communicated by means of toothed gear q, to the feeding rollers, r, (see fig. 3), by which means the edge of the florentine is advanced after cutting each range.

In order to set up or advance the sheets of metal after cutting each range of discs for the shells and shank pieces, a toothed wheel s, is placed in the middle of the upper feeding roller, which takes into a toothed wheel sliding on the shaft t. This shaft is therefore driven simultaneously with those employed in feeding the florentine, and their being two pinions of different diam-

ters fixed to this shaft, taking into racks *v*, *v*, and *u*, *u*, which racks are connected to the feeding apparatus by being attached to the carriages of the claws *g* and *i*, the sheets of metal are consequently drawn in when required.

“ The train of toothed gear which drives the carriers is actuated by a crank wheel, *w*, on the shaft *D*, see fig. 1. This wheel takes into a peculiarly formed star wheel, *x*, which is shewn in two positions, upon an enlarged scale at figs. 8 and 9.

“ By reference to the former specification, the mode of gathering in the edges of the florentine over the shell of the button will be perceived. I now perform that object in the manner shewn in figs. 10 and 11. The apparatus consists of two very thin plates of steel, sliding upon each other. They are mounted in brass frames, and placed between the two central carrier wheels, as shewn at *y*, *y*, in fig. 5. A peculiarly formed hole is made in each plate, the ends of each hole being circular, but of different diameters, so that when the plates are滑den in one direction, a circular aperture of about an inch is formed, and when they are滑den in the opposite direction, the aperture is contracted. This movement is effected by the crank levers *z*, *z*, acted upon by one cam wheel on the main shaft. Previous to these gatherers coming into action, the shell and with it, the disc of florentine beneath, is driven into one of the holes of the lower carrier wheel, as described in the former specification, by which the edges of the florentine are thrown up, round the shell, and being thus inclosed within the wheel, they are conveyed under the aperture of the gatherers, where, by the next operation of the lower punch they are raised up, and the edges of the florentine brought through the gatherers, which are then drawn so as to contract the hole and bring the edges of the florentine into a small

compass. At this time the punch with the shank piece descends upon the gatherers, and the aperture of the gatherers now opening, allows the shank to be pressed into the hollow shell, carrying the edges of the florentine in with it, which becomes sound and firmly fixed by the last operation of the punch."—*Unrolled in the Roll's Chapel office, September, 1829.*

Specification drawn by Mr. Newton.

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*To JOSHUA BATES, of Bishopsgate-street Within, in the City of London, Merchant, in consequence of a communication made to him by a certain Foreigner residing abroad, being in the possession of a new process or method of whitening Sugars.—[Sealed 1st August, 1829.]*

THE process of whitening sugars, specified under this patent, is a method of applying clear water so as to percolate through sugars, when either in a crystal state in the conical pots, after boiling, &c. or in the raw state, for the purpose of removing the colouring matter which is contained between the particles and crystals of the sugars, and is intended to be used instead of the usual method of claying, which is well known to possess many disadvantages. After describing the usual method of claying sugars, in order that the purport of his invention may be perfectly understood, the Patentee states that instead of using the 'batter' of pipe clay and water, as in common he uses, pans made of unglazed earthenware, and of a porous nature, (of the kind wine coolers are usually made), which pans are filled with clear water, and are placed upon the sugar in the conical mould pots, the water being

allowed to percolate through the interstices of these pans, and through the sugar, for the purpose of removing the colouring matter in a more even and regular manner than from the pipe-clay as in common ; the pans are to be made of the same shape as the base or largest part of the conical pots, and may be made so as to nearly fill them, but this is not necessary, as a half inch space may be left between the outside of the pan and the inside of the conical pot. In Plate XI, fig. 12, is a plan view, and fig. 13, a section of that shaped pan, which the patentee recommends, that is with the sides a little inclining inwards, as it may be more readily moved from place to place, but the pans may be made with the sides perpendicular, as in figs. 14 & 15; then the patentee recommends that they should have two handles projecting upwards, as shewn in the figure. The advantages which this method possesses over the common mode of claying are, that the workman can continue the process of whitening until completed, without being obliged to move the pans, and consequently save the time taken up in removing the various layers of clay batter, and that the supply of water is more regular than from the clay, which, when first put on, gives out much more water than after it has been draining some time ; and also that the sugar is not liable to be injured by the clay getting among it, or receiving a disagreeable taste or odour, which it is apt to get from clay which has been used several times. For whitening raw sugars in the conical shaped pots in common use, the patentee states that there is a great difficulty in getting the water to percolate through the sugar in an even and regular manner, as the water will make its way through it where least resistance is offered, and consequently the process is very imperfect, to obviate which the patentee uses shallow pots, which are divided into several conical compartments,

each having its own drip hole. One shaped pot, the bottom part of which is divided into seven compartments, each having a drip hole, is shewn in section, in fig. 16, and a plan view, looking in the mouth in fig. 17. Fig. 18, is a section of another pot, the hollow of which is divided into a greater number of small compartments, each having its own drip hole ; by the use of these shaped pots the patentee states that he is enabled to get rid of the colouring matter more readily, and with less injury to the grain or crystals of the sugar. The patentee of course intends to use the pans containing the clear water before described ; and he also states that the flow of water through the pores of the pans can be increased or retarded by having pans made of more or less porous material, or by putting sand or other materials into the bottom of the pans with the water, and thus retard its escape through the pan, and also that the conical mould pots may be quite filled with sugar, as it is not necessary to leave the space unoccupied which is taken up by the layer of clay and water in the common process of claying."—[*Inrolled in the Inrolment Office, February, 1830.*]

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*To WILLIAM PRIOR, of Albany Road, Camberwell, in the county of Surrey, Gentleman, for his having invented or discovered certain improvements in the construction and combination of Machinery, for securing, supporting, and striking the top-masts and top-gallant-masts of Ships and other vessels.—[Sealed 11th April, 1829.]*

#### SPECIFICATION.

" My improvements in the construction and combination of machinery for securing, supporting, and striking the

top-masts and top-gallant-masts of ships and other vessels, consists in the novel construction of an apparatus to be employed in place of the fid, usually applied to that purpose, which apparatus contains either a sliding or a swinging bolt, worked by a cam or eccentric roller. The two kinds of bolt with the rotatory cam are shewn in the several figures in Plate XI.

Fig. 1, represents the parts in operation; *a*, is the top-mast, shewn partly in section, which is supported by the two sliding bolts, *b b*. The bolts slide in sockets or carriages, resting upon the tressels *c, c*, and their points being projected forward into recesses in the sides of the mast, as shewn in this figure, support it as long as the bolts are prevented from sliding back, but when the bolts are allowed to recede, as in figure 2, then the mast loses its support, and slides down between the tressels. The particular feature of novelty in this invention is the contrivance whereby the bolt is retained in its place, which is by means of a cam or eccentric roller, *d*. Part of the roller is made cylindrical, and concentric with its axle, which fits into a segment-formed recess at the back part of the bolt, and while the concentric part of the roller bears against the recess, the bolt is prevented from receding, and consequently the mast is supported as in fig. 1. On turning the roller *d*, round by a hand spike, as *e*, or by a winch to be applied to its axle, or by any other suitable contrivance, the eccentric part of the roller is brought against the recess behind the bolt, as at fig. 2, and the resistance being thus removed, the weight of the mast bearing upon the points of the bolts, causes them to slide back, and allow the mast to descend as in the act of striking.

“ Fig. 3, shows a horizontal representation of the cross trees and tressels, with the top-mast, *a*, cut across in

section at the aperture where the points of the bolts enter; the bolts *b, b*, being projected forward as in figure 1. Figure 4, is a similar representation of the cross trees and tressels, the bolts being withdrawn, and the mast sliding down as in figure 2. In order to guide the bolts with certainty, a groove is cut in the upper part of each bolt, as shewn by dots in figures 1 and 2, for the purpose of receiving a concentric rib, carried round the excentric part of the cam, but I deem this rib and groove of little importance.

“ My other contrivance, consisting of swinging bolts, is shewn in the drawings at figs. 5, 6, 7, and 8. In fig. 5, as in fig. 1, *a*, is the top-mast, *b, b*, the bolts, swinging on pivots or axles, mounted in carriages, supported on the tressels, *c, c*. The excentric rollers, *d, d*, act against segment recesses at the backs of the swinging bolts, *b*, which confine them, and cause their points to support the mast, as in fig. 5. On turning the cam rollers round by a hand spike or other contrivance, the excentric part of the cam comes against the bolt, thereby releases it, when the weight of the mast bearing on the points of the bolts, causes them to descend, and the mast slides down as in fig. 6. The two horizontal views, figs. 7 and 8, represent the swinging bolt in the two positions, similar to the sliding bolt in figs. 3 and 4.

“ Having described the construction of my improved apparatus for securing, supporting, and striking the top-masts and top-gallant-masts of ships, &c. I wish it to be understood that the particular feature of this invention, and that which I exclusively claim under the above recited Letters Patent, is the cam or excentric roller for holding or releasing the bolt, whether the same be applied to a sliding or a swinging bolt.”—[*Inrolled in the Rolls Chapel Office, October, 1829.*]

Specification drawn by Mr. Newton.

*To SAMUEL BROOKING, Esq. of Plymouth, in the County of Devon, a Rear Admiral in our Royal Navy, for his having invented a certain turning or slipping Fid, for securing and releasing the upper Masts of Ships and Vessels.—[Sealed 6th May, 1828.]*

THE slipping or turning fid, described by the Patentee, in his specification of this patent is, a rod or bar of iron, or other metal, or hard wood, placed immediately over the central cross tree, and is made to turn in bearings, which are bolted upon the two tressel trees, having a flat surface for a part of the heel of the top mast to rest upon ; the other part being cylindrical. The heel of the top mast is formed with a notch, or projecting piece which rests upon the fid, when the top mast is up. The mast being kept in its place by palls or wedges, or by lashing, or otherwise fastening it to the top of the lower mast ; and when released to be struck, the notch or projecting piece is allowed to fall or slide off the fid, as it is turned round ; the flat surface presenting an inclined plane to the projecting piece, there being sufficient space between the central and the foremost cross tree, to allow of its descending.

Plate XI, fig. 9, is a vertical section taken through the ends of the masts, cross trees, &c., when the top-mast is up. Fig. 10, is a similar section, taken in the act of striking the top-mast, and fig. 11, is a plan of the cross trees, and tressel trees, shewing the situation of the fid. The same letters referring to similar parts in these three figures, *a*, is the main mast, *b*, the top mast, *c, c*, the two tressel-trees *d*, the central cross tree, *e*, the foremost crosstree, and *f*, the fid, turning in the boarings *g, g*, on the central crosstree. When the topmast is up, as shewn in fig. 9, it will be seen that the flat part of the fid, is under the notch or pro-

jecting part (*h*) in the heel of the topmast, and will support the mast while kept in this position by the palls *i*, *i*, which turn on bearings on the cross-tree *e*, into notches, in the heel or lower part of the topmast, or it may be kept in its proper place by wedges being driven tight between the crosstree, *e*, and the central crosstree *a*, as shewn by dots in fig. 9, or by any other means. When the topmast is to be struck, it is to be released from its position by raising and turning over the palls *i*, *i*, as shewn in fig. 10, or by knocking out the wedges or releasing it any other way, and by applying a sufficient power to turn the fid towards the topmast, which may be done by manual labour, by introducing levers or handspikes into the holes in the ends, *k*, *k*, of the fid, which project beyond their bearings, and on turning it partly round, the flat surface will form an inclined plane, as in fig. 10, and allow the projecting part of the heel (*h*) to slide down it, and pass through the tressels and cross trees. It will be understood that when the topmast is to be raised and secured again, the flat surface of the fid, is to be turned into the perpendicular position so as not to interfere with the mast as it rises, and when up, the fid is to be turned with the flat surface uppermost, and the mast let down upon it, and the palls turned over into their former position, or the wedges to be driven in. In order to render the fid firm and secure, and of sufficient strength to support the topmast, it is made to turn on a bed or bearing extending part or all its length, which bed may be a simple bar of iron, or of a fluted shape, as shewn in the drawing which the Patentee recommends as the best as it will hold any anti-friction material which may be used.—[Inrolled in the Inrolment Office, November, 1828.]

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*To WILLIAM STRACHAN, of Avon Eitha, in the parish of Ruabon, in the county of Denbigh, Manufacturer, for his having invented or found out an improvement in the making or manufacturing of Alum.—[Sealed 12th June, 1828.]*

#### SPECIFICATION.

“ IT is a well known fact that the Alum of Commerce has hitherto in this and other countries been principally if not wholly manufactured from substances, which contain combined naturally two of the constituents of that salt, the sulphuric acid and the alumine. It is also equally well known, that the green sulphate of iron (the copperas of commerce) is manufactured from the decomposeable sulphurets of iron, commonly called pyrites, and that this is effected by exposing these sulphurets to the action of the air in a heap, (called by the copperas manufacturers a bed), by which means a decomposition takes place, which being encouraged by rain and the throwing on of water, a liquid sulphate of iron is produced, which, after evaporation to a certain point, and saturation with iron, is allowed to crystallize, and forms the green sulphate of iron, or copperas. Now my invention and improvement consists in the making available for the manufacture of alum, the sulphate of iron, whether in the state of the raw liquid sulphate of iron, so used hitherto for the making of copperas, or of the crystallized sulphate of iron, or copperas of commerce.

Before I proceed to describe how I effect this, I will for the benefit of those persons, if such there be, who are not acquainted with what is by the copperas-makers called a ‘ bed,’ describe what I consider the best mode of forming one.

“ The ground on which it is intended to stand should in the first place have a low wall built round it, about eighteen inches high. This must be puddled and rammed such a covering of clay, as will be sufficient to form a water-tight bottom. The bed should have a considerable inclination or slope, in order that the liquor may run from it as quickly as it attains the bottom. The clay should be covered with bricks, flags, tiles, lead, or other substance capable of resisting the action of sulphuric acid, and the top of this last covering being even with the top of the wall, the whole forms a sloping, even surfaced platform. Upon this platform the pyrites are to be piled up or deposited, but I consider it is adviseable before depositing the pyrites, to lay a course of good sized round pebble stones, in order by raising the pyrites from the bottom, to admit air under, and consequently, through the pyrites, by which the decomposition will be greatly expedited, water being from time to time thrown over the pyrites ; the liquid sulphate will be given out, and must be received in a cistern or other convenient receptacle at the bottom. The thicker the pyrites are heaped up, of course the stronger will this liquor run from the bed, which bed should however be six feet thick at the least. The size or superficial surface of the bed must of course be proportioned to the wants of the manufactory ; the shape I do not consider a matter of much moment, though I prefer an oblong parallelogram, the slope falling to one of the longer sides, over the bottom of the ‘ bed,’ of which shape the liquor will have a shorter distance to run, and consequently the chances of loss be diminished.

“ I must here state that I do not claim the ‘ bed,’ or the above method of forming one, as any part of my invention, for the purposes of which the pyrites may be placed in any other plan, manner, or form, as may be

considered best and most convenient for effecting their decomposition, the foregoing instructions being only given as a description of what I consider the best mode of exposing the pyrites, for decomposition, and obtaining the greatest quantity of the resulting liquid sulphate of iron. Supposing therefore, a supply of liquid sulphate of iron, arising from the decomposition of the material pyrites of iron, however placed for the purpose of decomposition. Or if from any circumstances it shall be deemed preferable to use it, the crystallized sulphate of iron, or copperas of commerce to be at hand, I proceed in this order to make the sulphate of iron (in either state) available in the manufacture of alum, I procure a quantity of aluminous clay, or earth, or other substance, containing alumine as white and as free from iron as possible, and also as clear from gravel and other contaminating matter, as is to be had.

" I have from experience found the light grey coloured clay shale found among the coal mines, answer the purpose extremely well. Whatever aluminous substance may be used, it is advisable, by grinding with rollers, pounding, or some other such method, to reduce it to an even degree of fineness; but this is not absolutely necessary, and I practise it only as a means of making lighter the labour. In the next part of the process this aluminous matter I ultimately mix and impregnate with a quantity of the liquid sulphate, arising from the decomposition of the material pyrites of iron, or of the crystallized sulphate, or copperas of commerce, and submit the mass or matter so impregnated to the action of heat. This may be done in a furnace, kiln, oven, or other convenient contrivance, by putting the aluminous matter therein, and when there, and while under the action of heat, throwing in or otherwise applying the liquid sulphate of iron, or other alu-

minous matter which may first be mixed and impregnated with the liquid sulphate of iron, and then thrown into the furnace, kiln, oven, or other contrivance, and there subjected to the action of heat, until it is thoroughly dried and calcined.

“ I should observe that when the crystallized sulphate of iron, or copperas of commerce is used, it may be employed either in the state of crystals, or it may first be dissolved in water. If, in the state of crystals I should recommend a small quantity of water to be thrown upon the mixed clay and crystals when in the furnace, in order to assist the water of crystallization of the copperas, in disseminating the sulphate more evenly through the mass. When the impregnated clay is sufficiently calcined, it will have assumed a pale red colour, and is to be raked or drawn out, and in a cistern, or other convenient receptacle, lixiviated by being covered with water, and from time to time stirred or plunged up. When the water has extracted from the impregnated matter or substance, all its available strength, which it will have done in about three days, it will be formed into a liquid sulphate of alumine, varying in strength in proportion to the strength of the liquid sulphate of iron, and the quantity of it employed to impregnate the aluminous matter, and the quantity of water used to lixiviate the calcined aluminous substance after it has been so impregnated. This liquid sulphate of alumine is now ready to be converted into the alum of commerce, by being combined with the alkali, and treated in the usual mode adopted by the manufacturers of alum, from the materials in common use.

The effect of this process of impregnation, calcination and lixiviation, is this, the iron being by the heat so far oxidized as to have become insoluble, the sulphuric acid, the other constituent of the sulphate of iron, seizes on the

alumine contained in the matter or substance with which it was mixed, and forms the sulphate of alumine which is dissolved, taken up, or rendered liquid by the water with which the impregnated mass is lixiviated.

" Having thus stated the combination of which my invention consists, I shall proceed to describe the apparatus, and method I have adopted for applying those principles to practice; I pass the clay, earth, or other aluminous matter I intend using through iron rollers, and when sufficiently crushed and prepared, I throw about thirty hundred weight into the furnace.

" This consists of a common arched reverberatory oven, about nine feet long by six feet wide, having at one end, a fire place, extending the whole breadth, and separated from the floor on which the matter to be acted upon is placed, by a bridge or midfeather; at the other end is the chimney; in front are three springs with sliding iron doors for charging and discharging the furnace, and stirring the contents during the operation. The fire I keep at a moderate heat, until the clay, earth, or other aluminous matter is dry, when I proceed to throw in the sulphate of iron upon the aluminous matter, stirring the mass up with rakes; this is continued until the whole dose of sulphate (which may be from four to five hundred weight if the crystallized be used, or from one to two hundred gallons, if the liquid) is thrown in, when the fire is urged higher, the raking being continued adding from time to time water, when the crystallized sulphate is used, until the impregnated clay, earth, or other aluminous matter is quite dry, and so calcined as that the iron which was contained in the sulphate of iron, is so far oxidized as to have become insoluble. When this is effected, which may be known by the mass having assumed a highly reddish color lixiviation, for the purpose, I have a row of stone cisterns

about two feet deep, and each of sufficient capacity to contain one charge of the oven or furnace, and as much water as will cover it well; I have also one general receiving cistern, so placed as to receive the liquor from all the extracting cisterns.

“ The impregnated and contained clay, earth, or other aluminous matter, is when sufficiently calcined, raked out of the oven or furnace, and put into one of the extracting cisterns and covered with water; after remaining for two or three days being stirred and plunged up frequently, it is let off into the receiving cistern, and is now ready for evaporation. Instead however, of immediately running this liquor (which is the liquid sulphate of alumine) into the evaporator, I think it desirable, in case the strength should be less than fifteen per cent above water, (which will depend upon the strength and quantity of the sulphate of iron used) that the liquor should be returned over freshly impregnated matter, until it has attained that strength.

“ The boiler I use for evaporation and which I have found very effective, is an arched chamber, twenty-two feet long, seven feet broad, and three feet deep from the spring of the arch, formed of stone, and arched with brick, having at one end a fire place, extending the whole breadth, separated from the body of the chamber, by a watertight bridge or midfeather. This boiler chamber or cistern being filled with the liquid sulphate of alumine, to within a few inches of the top of the bridge or midfeather, the flame or heat radiates down from the arch, and sweeps over the whole surface of the liquor, taking the steam produced with it up the chimney in a continued stream, the evaporator being supplied with fresh liquor as the water is thrown off.

“ This is the contrivance I use, but of course any other

method may be pursued as thought best. During the concentration the alkali, (the other constituent of alum) is to be added. This may be either the muriate of potash, the sulphate of potash, potash itself, or any other salt usually employed by alum makers, though I prefer the first. I consider it best to allow the evaporation to proceed until the liquor is concentrated, to from thirty to thirty three per cent above water, before adding the alkali, the proportion of which will be the same as commonly used by alum makers, and must of course depend on the quality of the alkaline salts employed. When the alkali has been added, the concentration is to be carried on till the liquor has attained the strength of from thirty five to thirty eight per cent above water, it is then to be let or drawn off into coolers, for crystallization ; at the end of about ten days, the mothers may be drawn off, when the alum will be found in crystals in the cooler. These crystals are to be washed redissolved in clean water and again crystallized and thus repeated.

“ It is now pure alum and fit for all uses to which alum can be applied, but as alum is generally sold in large masses (the process of forming which, is called “rocking”) it may for this purpose be again dissolved in a small quantity of water, as will at the greatest degree of heat, which can be communicated to it, take up in solution, and run it into casks or tubs so constructed, as to be easily taken to pieces and again set up ; in these it should remain from ten to fourteen days, when the mothers may be let off, the casks taken to pieces and the alum broken or cut up into pieces for sale.

“ I must here observe, that the clay, earth, or other aluminous substance, which has been impregnated with the liquid, sulphate of iron may after being lixiviated serve for the same purpose, for a considerable number

of times varying with the quantity of alumine contained therein originally until the whole alumine has been taken up by the successive applications of the sulphate of iron, and also that the mothers of the first and all the subsequent crystallizations may be used over again without limit, I must also observe that all the vessels and apparatus used in the manufacture, must be composed of materials capable of resisting the action of sulphate.

And after having fully described the whole course of my mode of manufacturing alum, using for the purpose of such manufacture from the sulphate of iron here, to prevent mistake or misconception, explicitly state and declare of what my invention and improvement consist. I do not claim as my invention the "bed" or the mode of forming one I have pointed out. Nor do I claim, as my invention, any part of the apparatus or process by which the liquid sulphate of alumine as converted into the crystallized alum of commerce; what I do claim as my invention, and an improvement in the manufacture of alum, is the new combination in making available in the manufacture of alum; the sulphate of iron, whether in the state of the liquid sulphate, resulting from the decomposition by exposure to the air and water, however they may be placed for that purpose, of the decomposable sulphurats of iron, commonly called pyrites, or of the crystallized sulphate of iron or copperas of commerce, by producing from the same, combined with clay, earth, or other substance, containing alumine, a liquid sulphate of alumine, which being treated with the usual mode adopted by alum makers, may be formed into alum for the purpose of forming this liquid sulphate of alumine; I do not intend to confine myself to the apparatus, or mode of using the apparatus I have before described, or to any other particular apparatus or process, but do for this pur-

pose claim and assert my right to extend to all and every apparatus, by which may be effected the object required, namely, the mixing or impregnating aluminous clay, earth, or other substance, containing alumine with the sulphate of iron, in either state, exposing the clay, earth, or other substance, so impregnated to the action of a heat, sufficient so far to oxidize the iron, as to render it insoluble, and by means of water dissolving, taking up and forming the liquid sulphate of alumine.—[*Entered in the Inrollment Office, Oct. 1828.*]

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*To JAMES WATT, of Stracey-Street, Stepney, in the county of Middlesex, Surgeon, for his having discovered, by the application of a certain chemical agent, means by which Animal Poison may be destroyed, and the disease consequent thereon effectually prevented.—*  
[Sealed 29th April, 1828.]

IT has always appeared to us to be a useless expenditure of money to obtain Letters Patent for a *medicine*, which, being once known to be an effective remedy against, or cure for any particular disorder, and its constituent parts published in the specification, may be prescribed by every physician without the knowledge of the Patentee; or even with his knowledge, as far as we can, without any legal means of his preventing it. These remarks apply generally to all patent medicines, and particularly to the subject now before us, which is merely a wash to be employed as a preventive or destroyer of an animal poison, which is the term given by the Patentee to certain contagious diseases.

When the disease is supposed to have been contracted by contact with a contaminated person, the injured part is to be thoroughly washed with soap and water, and then with water strongly impregnated with chlorine. Indeed, the part is to be soaked with the liquor, and covered for some time with cloths rendered completely wet by immersion in the liquor.

It is recommended that the water should be impregnated with chlorine gas, by means of a force pump in a close vessel in the way that soda water is commonly made; and when so prepared it may be bottled up for use, taking care that the bottles are carefully stopped.

In some cases it is proposed to employ the chlorine in the form of gas, but when that is not convenient, the lotion above described is to be used.—[*Enrolled in the Inrolment Office, October, 1828.*]

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*To BENJAMIN AGER DAY, of Birmingham, in the county of Warwick, Manufacturer, for his having invented Improvements in the manufacture of Picture Frames in various ways, forms, and sizes.—[Sealed 28th August, 1828.]*

THE invention specified under this Patent is for making picture frames of stamped or pressed metals, or a mixture of metals, which are to be japanned, lacquered, or coloured, to represent those picture frames which are usually made of paper japanned. The invention is comprised under three heads—first, making picture-frames of metal, which are to be stamped into the proper form and pattern

by the punches and dies prepared for the purpose, and when made in pieces, are to be soldered together.

The second feature proposed, is the introduction of Gothic or other architectural ornaments in the corners and those parts of the frame which the glass is to fit into; and the third, is the making of these Gothic ornaments occasionally of paper moulded and japanned.—[*Enrolled in the Enrollment Office, October, 1828.*]

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*To JOSIAS LAMBERT, of Liverpool Street, in the city of London, Esq., for his invention of an Improvement in the process of making Iron applicable to the smelting of the ore, and at various subsequent stages of the process, up to the completion of the rods or bars; and a new process for improving of the quality of inferior Iron.—[Sealed 4th February, 1830.]*

To improve the quality of iron the Patentee proposes, when it is near, or while in a state of fusion, to introduce into the furnace salt, potash, and lime, which he conceives will assist in decomposing the earthy matters in connexion with the iron, particularly in the smelting process. We do not perceive the novelty of this process, as salt at least has been long applied with beneficial effects in different stages of the manufacture of iron, and particularly in the puddling furnace. See *Luckcock's Patent*, vol. x. p. 250, of our First Series.

#### SPECIFICATION

“ This improvement in the process of making iron applicable at the smelting of the ore and at various subse-

quent stages of the process up to the completion of the rods or bars, consists, in the application of salt, potash, and lime, mixed or combined together to the iron ore or iron in the blast furnace, the refinery furnace, the puddling furnace, the balling or reheating furnace, or in any other process to which the iron in its manufacture is subjected when considerable heat is applied; and it likewise consists, in the application of salt, saltpetre, and lime, mixed or combined with the iron in the puddling furnace, whether the same iron shall have been subjected to the application of salt, potash, and lime, in any of the previous operations of the manufacture or not.

“ The proportions in which I recommend the mixture or combination of salt, potash, and lime, to be formed, are two parts of salt, one part of potash, and two parts of lime; but should the proportions in some degree differ from those best adapted to the purposes the useless portions will be dissipated in the process of the manufacture.

“ The mixture or combination employed during the process in the blast furnace should be applied at the time of smelting the materials, which are to produce the iron at the rate of about twenty-five pounds to the ton of iron, and may be introduced in proportionate quantities at the tunnel head of the blast furnace, either at intervals, or with every charge of the materials which are to produce the iron. If not used in the process of smelting, it may be applied at intervals to the metal during the operation in every charge of the refinery furnace, or in the puddling furnace, or in any other process to which the iron in its manufacture may be subjected when considerable heat is applied.

“ A proper proportion to be used in the refinery furnace may be at the rate of twenty pounds to the ton of iron,

and in the puddling furnace about eighteen pounds to the ton of iron ; but in the balling or reheating furnace and other processes, the quantity to be applied must depend upon the quality, form, and substance of the iron, taking care that it be sprinkled over and amongst or brought in contact with the iron ; the quantity to be employed will vary from about eighteen to thirty pounds per ton of iron.

“ The proportions in which I recommend the salt, saltpetre, and lime, to be mixed or combined, are two parts of salt, one and a half parts of saltpetre, and two parts of lime. This mixture or combination of salt, saltpetre, and lime, should be applied to the iron in the puddling furnace whilst the metal or pig iron is in a state of fusion, and may be mixed with it at intervals at the rate of about twenty pounds to the ton of iron. The quantities to be applied of either of the above mixtures will differ in some degree according to the quality of the materials or the iron : but the proportions above mentioned are those proper on the average.

“ The process for the improving of the quality of inferior iron, consists in the application of either of the same mixtures in similar proportions to such iron when subjected to considerable heat: for this purpose they may be applied to the iron, and the iron melted in combination with them, or they may be applied to the iron in the puddling furnace in such quantities as may be best adapted to improving the quality of the iron according to its properties more or less exhibited, of being what is termed red-short or cold-short, (that is to say), the application of the mixture of salt, potash, and lime, is best adapted to the iron which is termed red-short, and the mixture of salt, saltpetre, and lime, is best adapted to the iron termed cold-short.

“ The quantity of the mixtures to be employed in either case, will vary from about eighteen to thirty pounds per ton of iron, according to the degree of inferiority of the iron ; or the mixtures may be applied to the iron in any reheating or other furnace, and the metal subjected to a red heat for a time proportioned to the quality, form, and substance of the iron, care being taken that the mixtures be applied in contact with the heated metal ; and for this purpose, if the iron be in the form of tubes, such as gun barrels, the mixtures may be introduced into the tubes.”—[Unrolled in the Petty Bag Office, April, 1830.]

### Novel Inventions.

#### *Improvements in Spinning.*

An ingenious mechanic in America, named Dornforth, has invented a very simple improvement in spinning machinery, which is attracting very considerable notice at Manchester, and appears to afford the means of producing the finest yarns without the great risk of breaking, to which yarns of the higher numbers have been so much subject, when wound on to the bobbin by the flyer as heretofore.

The contrivance consists of a stationary spindle, from the top of which a circular polished rim is suspended instead of a flyer. The bobbin being made to revolve, rapidly spins or twists the yarn as it descends from the drawing rollers, and the slight friction of the yarn, as it goes round against the stationary polished rim, aided by the resistance of the atmosphere, produces that retardation which causes it to lap up or wind on to the bobbin.

The invention is secured by patents in the different European States; that in England is in the name of John Hutchinson, Esq. of Liverpool.

## SOCIETY OF ARTS.

*The Rewards adjudged by the Society, 1830, presented by the Earl of Radnor, Vice-President.*

- To J. Peart, Esq. Settle, Yorkshire, for improving land lying waste, the gold Ceres medal.
- W. Burton, Esq. Field Hall, near Uttoxeter, Staffordshire, for his swing frame for turning cheese, the large silver medal.
- Mr J. Chancellor, Dublin, for his clock escapement, the large silver medal, and 25*l.* —
- Mr. James Harrison, Barton on Humber, for his clock escapement, the large silver medal, and 10*l.*
- Ditto, for his fly for turret clocks, the silver Isis medal, and 10*l.*
- Mr. H. Wilkinson, Pall Mall, for his oil for chronometers, the gold Isis medal.
- the Rev. G. S. G. Stonestreet, Halton, near Hastings, for his tide semaphore, the gold Isis medal.
- Mr. J. Bothway, R. N. Plymouth, for his method of securing the lower yards of ships of war, the large silver medal
- Commander W. H. Hood, R. N. for a rocket staff, the largo silver medal.
- the Chevalier Aldini, for his apparatus for the use of firemen, the gold Isis Medal.
- Mr. J. Braidwood. Edinburgh, for his fire escape, the large silver medal.
- Mr. J. Henfrey Bowling-green-street, Kennington, for his fire escape, the large silver medal and 10*l.*
- Mr. J. Reilley, Finsbury-place, for an adjustable pack saddle, the silver Isis medal.
- Mr. T. R. Yare, Dean-street, Soho, for a muzzle for crib-biting horses, the large silver medal.
- Mr. W. H. Hilton, Regent-street, for an instrument for boring the bung-holes of casks, the large silver medal.

To Mr. Samson Travis, Gray's-street, Blackfriars Road, for a dowel box for boring sash frames, the silver Isis medal, and 5*l.*

— Mr. W. Dungey, New Compton-street, Soho, for a carpenter's holdfast, 5*l.*

— Mr. T. Lowthorp, Watlebury-street, Euston-square, for his emery cloth, the silver Isis medal, and 5*l.*

— Mr. J. Good, Hereford, for his syphon well, the large silver medal.

— Mr. J. Ritchie, Stafford-street, Bond-street, for his photometer, the large silver medal.

— Mr. J. Roberts, Queen-street, Cheapside, for his reflectors to the miner's safe lamp, 5*l.*

— C. Verrall, Esq. Seaford, Sussex, for his prone couch, the silver Isis medal.

— Mr. George Bunney, Lower Eaton-street, Pimlico, for his surgical belts, the silver Isis medal.

— Mr. S. T. Brittlebank, South Molton-street, for a copy in Indian ink of a print, the silver Isis medal.

— Mr. H. J. Vully, Angel-lane, Hammersmith, for a copy in chalk of a head, the silver Isis medal.

— Mr. C. Gwatkin Hill, Regent-street, for a copy in oil of a portrait, the large silver medal.

— Mr. Geō. Fred. Duncumb, Paradise-row, Chelsea, for a copy in water-colours of flowers, the silver Isis medal.

— Mr. W. Dickes, Temple-street, Southwark, for a copy in pencil of animals, the silver Isis medal.

— Mr. S. Stevens, Harleford-place, Kennington, for a copy in pencil of a print, the silver Isis medal.

— Mr. W. King Toase, Little Queen-street, Holborn, for a copy in oil of a portrait, the large silver medal.

— Mr. W. Barth, Cockspur-street, for a copy in pencil of animals, the silver Isis medal.

— Miss Du Pasquier, St. James's Palace, for a copy in chalk of an historical subject, the silver Isis medal.

- To Miss Vendramini, Chiswick Mall, for a copy in chalk of an historical subject, the silver Isis medal.
- Miss Belinda S. Wiggins, Piccadilly, for a copy in oil of a landscape, the silver Isis medal.
- Miss Sharpe, Fleet-street, for a copy in chalk of a figure, the silver Isis medal.
- Miss Lester, Elm-street, Gray's-inn-road, for a copy in India ink of a figure, the silver palette.
- Miss Lucy S. Richardson, Queen's Row, Pentonville, for a copy in chalk of a head, the silver palette.
- Miss Louisa J. Holden, Dartmouth-street, Westminster, for a copy in chalk of a head, the silver Isis medal.
- Miss Augusta E. Cole, Red Lion-square, for a copy in pencil of a landscape, the silver Isis medal.
- Miss Fanny Crockford, Sussex Place, Regent's Park, for a copy in water-colours of a landscape, the silver Isis medal.
- Miss S. Lockwood, Doncaster, for a copy in water-colours of flowers, the silver palette.
- Miss Mary A. Richardson, Queen's Row, Pentonville, for a copy in water-colours of flowers, the silver Isis medal.
- Mr. S. Blackburn, Upper Charlotte-street, Fitzroy-square, for a drawing in outline from a statue, the large silver medal.
- Mr. J. Reed, Charlotte-street, Bloomsbury, for a finished drawing from a statue, the silver Isis medal.
- Mr. W. E. Frost, High-street, Wandsworth, for a finished drawing from a statue, the large silver medal.
- Mr. J. Clements Miles, Aldenham Terrace, Old Pancras Road, for a drawing in chalk from a bust, the large silver medal.
- Mr. J. Calcott Harley, High Row, Kensington Gravel Pits, for a drawing in chalk from a bust, the silver Isis medal.
- Miss Mary A. Williams, Charlotte-street, Bloomsbury, for a drawing in chalk from a bust, the silver Isis medal.
- Miss Frances Burrell, Park Square, Regent's Park, for a drawing in chalk from a bust, the large silver medal.

To Mr. Jos. J. Jenkins, Great Queen-street, Lincoln's Inn Fields, for an original drawing in water-colours of figures, the large silver medal.

— Miss Fanny Corbaux, Hercules Buildings, Lambeth, for an original portrait, a miniature, the gold Isis medal.

— Mr. J. Scott White, Brownlow-street, Holborn, for an original portrait in oil, the large silver medal.

— Mr. R. Williams Warren, Red Lion-square, Holborn, for an original portrait in oil, the gold Isis medal.

— Mr. T. W. Dagnall, Winstone Terrace, Waterloo Road, for a landscape composition in oil, the silver Isis medal.

— Mr. G. Sims, Davis-street, Kennington, for a landscape composition in oil, the large silver medal.

— Miss Leonora Burbank, Church-street, Camberwell, for a composition of flowers in water colours, the silver Isis medal.

— Mr. Philip Purcell, Dunt's Hill, Wandsworth, for a composition of flowers in water colours, the large silver medal.

— Mr. J. Alex. Mitchell, 5, Great Pulteney-street, Golden-square, for an original painting in oil, of animals, the large silver medal.

— Mr. Jos. Tanner, Little Russell-street, Covent-Garden, for an original painting in oil of still life, the large silver medal.

— Miss Caroline Eggbrecht, Frith-street, Soho, for an original drawing of a landscape, the silver palette.

— Miss Charlotte A. Lester, Elm-street, Gray's Inn Road, for an original drawing in water colours of a flower, the silver Isis medal.

— Miss A. Redaway, Frith-street, Soho, for a composition of flowers in water colours, the large silver medal.

— Miss Mary Atkinson, Grove End, St. John's Road, for an original drawing in water colours of a flower, the silver Isis medal.

— Miss Chappell, Ockbrook, near Derby, for an original painting in oil of animals, the large silver medal.

To Miss Mary E. Best, York, for a composition of still life in water colours, the large silver medal.

— Mr. Alfred H. Taylor, Rathbone-place, for an original portrait in chalk, the silver Isis medal.

— Mr. J. Ginn, Hollywell-street, Millbank, for a model of a bust from the antique, the large silver medal.

— Mr. J. Bell, Charlotte-street, Bloomsbury, for a model of a bust from the life, the large silver medal.

— Mr. Fred. Orton Rossi, Grove-street, Lisson Grove, for a model of a figure from the antique, the silver Isis medal. —

— Mr. Joshua Manning, Tottenham Court Road, for an original model of a group, the gold Isis medal.

— Mr. James Stevenson, Upper Seymour-street, Somers Town, for an engraving of an historical subject, the large silver medal.

— Mr. H. Bateman Jenkins, Great Queen-street, Lincoln's Inn Fields, for an engraving of a portrait, the silver Isis medal.

— Miss Elizabeth Branston, Golden Terrace, Pentonville, for an engraving on wood of an animal, the large silver medal.

— Mr. J. Brett, Dolphin Place, Holborn, for an engraving of a head, the large silver medal.

— Mr. Fr. F. Cuisset, Castle-street, Holborn, for an intaglio of animals, a copy, the silver Isis medal.

— Mr. T. J. Woodbridge, Banner-street, St. Luke's, for a copy of an historical subject in embossed silver, the large silver medal.

— Mr. S. West, Henrietta-street, Brunswick-square, for a perspective drawing of an ornamented capital, the large silver medal.

— Mr. George Moore, Welbeck-street, for an original design for a village church, the large silver medal.

— Mr. S. C. Brees, Warwick Court, Holborn, for an original design for a village church, the gold medallion.

— Mr. Daniel Squirhill, Grove-street, Lisson Grove, for an original design for a fountain, the gold Isis medal.

To Mr. Allen Webb, New Burlington-street, for a coloured anatomical drawing, the large silver medal.

— Mr. J. Henry Walsh, King street, St. James's-square, for a coloured anatomical model, the gold Isis medal.

— M. Felix Feuillet, Paris, for his method of transferring prints, the large silver medal.

— Mr. A. R. Burt, Chester, for his portable easel, the silver Isis medal.

— Mr. R. Cowling Taylor, Carlton Chambers, Regent-street, for his models of part of the South Wales coal field, the gold Isis medal.

— Mr. S. Dean, Grosvenor Place, Bethnal Green, for his machine for punching pattern cards for the Jacquard loom, 10*l.*

— Ditto, for his improved silk loom, the silver Isis medal and 10*l.*

— Mr. W. Jenniugs, Manchester-street, Waterloo Town, Bethnal Green, for his improvements on the Jacquard silk loom, the large silver medal and 15*l.*

— Mr. George White, Glasgow, for his power-loom for fine fabrics, the large silver medal and 25*l.*

— Lieut. H. Lister, Maw, R. N. for pigments, &c. collected by him in South America, the large silver medal.

ARTHUR AIKIN, SEC.

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### RE P O R T

#### Of the Select Committee of the House of Commons on the Laws of Patents.

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(Continued from page 242.)

Mr. John Farey, called in; and Examined.

WHAT do you think of the law which allows you to take out a patent for an invention communicated to you by a foreigner, and not allowing you to take out a patent for an invention communicated to you by a British subject?—I am not aware of any advantage in it, except as the contrary might tend to be a premium to the fraudulent obtaining of inventions. If the invention

were fairly assigned, there is no reason whatever why a patent should not be taken out by the assigner, and in many cases with great advantage; because it so constantly happens, that the inventor is not so well qualified to pursue his invention into actual practice, as some other person, who for that very reason would become the purchaser, if encouraged by law.

If it can be proved that fraudulent possession has been obtained of the invention, it should be restored to its owner, or full compensation made?—Certainly; there can be no objection to patents to assignees of inventors; it would be a very great advantage indeed to make such a law; there was a bill before the House, some years ago, which I think contained that as one part of the provisions.

May not the present law operate with great injustice to the widow and children of an inventor, who dies before his patent is taken out?—The executor or administrator can take out a patent in that case; that is the reason in the case I have before mentioned, why eighteen months was granted; that is not by law but by custom. If a patentee dies before he signs and acknowledges his specification, the patent is lost, but the executors may take a new one, provided the secret has not got abroad, and they pay all the fees over again. The useless ceremony of appearing before a master to acknowledge, is sometimes a hardship in such cases. My brother took a patent, and fell ill by a paralytic stroke, before the specification was due, but the draft had been made out, and in very good time he signed the deed in bed; but after that it was very nearly lost, because he could not get out to acknowledge, as he had expected to be able to do; and if the master had not come to his bed room at the very last, the patent would have been lost.

Since a patent for the three kingdoms, with the attorney's bill, costs from four to five hundred pounds, does not that operate as a tax upon different inventions with great inequality? The expense of the patents for the three kingdoms is decidedly too high, but I do not think that the expense of a patent for one kingdom is too high; I think that the present expense of a patent for England, would be about the proper expense for a patent for the whole of the British dominions. I mean, that in the absence of any other check to an unlimited multiplication of patents, they should not be granted too cheaply. At present, while patents are to be had merely for paying the fees, there must be some limitation applied by means of the expense, and I think the present expense of a patent for England is a limitation which is sufficient; but when to the expense of a patent for England, the expense of one for Scotland, and another for Ireland, is added, and also an additional variable expense depend-

ing upon the difficulty of the subject, the sum total is in my opinion too much for mere limitation, and becomes a tax upon particular inventors, who are commonly the most deserving of encouragement.

Does any method occur to you of having the cost of a patent made proportionate to the importance of the patent?—Possibly it might be desirable to make little or no expense in the first instance, but to apply an annual and increasing tax upon the continuance of the patent right. To make the annual tax scarcely any thing at first, but to make it afterwards such a progressive tax from year to year, as would at last induce inventors to abandon the right before the end of the term, which in that case should be longer than at present (say 21 years). If the inventions were not very good ones, the patents for them would be cut off by this course, sooner or later. On such a plan, government might always ease a deserving inventor, by remitting his tax, when he had not been properly rewarded. But this is only a first thought, which I have not pursued through all its consequences; it would require much regulation. The proceeds of such taxes might be accumulated as a fund, to reward meritorious inventors, whose patents, like Mr. Woolf's, have not produced them a proper recompense for the services they have rendered to the community; also to purchase valuable secrets, which patents cannot be expected to protect.

You stated, in certain cases, that a part of the expense of taking out a patent consists of payments to professional gentlemen, does that arise from any useless complexity in the law respecting specifications?—Yes, it does; to the complexity of the process of obtaining a patent; and the necessity of specifying completely in a given time, which is often too short. It applies very forcibly to the law proceedings upon patent rights, which does not permit amendments or improved specifications. In obtaining of patents, the costs that are occasioned by payments to the officers of the Crown are fixed and invariable, except in a few cases, the others, relating to the specifications are necessarily variable, and according to the nature of the subject. I think that the sum total to the patentee should be made invariable, or nearly so.

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Benjamin Rotch, Esq. again called in; and Examined.

You proposed giving the Committee some more evidence?—It was only on one subject more I proposed to give any evidence upon, except it might be elicited by questions; it was merely on the subject of invalidating a patent because any one trifling thing in it happened not to be new; and the case that is perhaps

the strongest case in point upon the subject, is the case of the chain cable. There was a trifling thing connected with the anchor introduced into that patent, and though the chain cable itself was of special importance, the patent was upset because something connected with the anchor was introduced into that patent which was proved not to be new. I should think it was extremely desirable some provision should be made for the public to have the use of that which is not new in the patent, but that still the patentee should have the benefit of what remained ; this, of course, would open a door to patentees making experiments with the public feeling ; they had not the responsibility they have now, and which is a very useful check if they did put in any thing old. They would try experiments, and to guard as much as possible against this, I have one suggestion I wish to lay before the Committee, and that is, if any thing should be found in the patent that is old, *a certain portion of the term* should be forfeited thereby, merely as a check upon the patentees ; whatever that portion may be, may be a matter to be filled up afterwards, if the suggestion was thought worthy of notice ; and having stated that I have no further suggestions to volunteer than what will be found upon the notes of the evidence I have already given.

Will you have the goodness to describe how they brought in something about an anchor in a patent for a chain cable ?—I really forget ; I do not recollect the patent sufficiently to state what it was.

From your experience, do you find there is much uncertainty in the opinion of Judges as to the law of patents ?—Very great, insomuch so that it is constantly advised by barristers, withdraw your record to-day, because such a Judge sits for such an one who is ill ; withdraw your record ; they dare not try it ; and if a country cause is going to be tried, why did you not lay your venue in Middlesex, before Lord Tenterden, who takes a very liberal view of patents ; why did you lay the venue in the country, to try it before a Judge who has a very contrary feeling ? The whole I have submitted to the Committee was with a view to establish a certainty, and not to admit of this fluctuation ; because my own knowledge tells me, there are hundreds of patents that might be brought out, but which people will not bring out ; first, from the difficulty of sustaining the patent ; and, secondly, because if they go to the expense of machinery, and complete the manufacture without a patent, they get nothing by it, because their neighbours do the same immediately, and there is no inducement for private individuals to bring them forward : if a large manufacturer does it, it may be an advantage to the general body, but not to him-

self particularly; but you do not get individuals often to look so far as that; the expense being great, unless they can *recoup* themselves, they do not think it worth while to bring it forward; but certainly the greatest point is the indecision of the Judges in deciding what is the object of the patent, because it is generally on the wording of the title of the patent with regard to the specification that patents are upset on the specification, and it is not one time in ten that the patent is upset on the specification, merely because it does not describe the invention in a way that will enable a workman of common ability to execute it; but the grand difficulty is the uncertainty of the opinion of the Judges as to what is the subject of a patent, in fact, what is the meaning of the word *manufacture*; and I think, after the reference made to Lord Tenterden's opinion, nothing can show more completely how much they are at sea upon the subject; where a Judge says, it is often taken to mean so-and-so; those words are quite distressing to advocates, they do not know how to advise.

Does not it follow, you are very frequently in the habit of advising a compromise where it is offered; where it would be much better if the Judge and the jury understood the thing, not to compromise at all?—Very often, indeed.

Are you aware of any cases where persons have compromised upon any understanding in the trade, so as to restrain the use from other parties?—Frequently.

Can you mention any cases?—No, I cannot; it will be a sort of breach of professional confidence to mention the cases that have come before me by name.

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Mr. John Isaac Hawkins, called in; and Examined

ARE you acquainted with the law in Austria as to granting patents?—I have a copy of it.

Will you be so good as to put it in?—[The witness delivered in the same, which was read. Vide Appendix (F.) I will also put in a list of the number of patents taken in Austria the first six years of the existence of this patent law; it began in 1820. Here is a statement of the number of patents taken out in Austria, and in France and England, in the six years succeeding. [The witness delivered in the same.] See Appendix (F. 1.)

Do you know any thing of the working of that law?—Very little.

What number of patents were taken out in the six years preceding the new law?—In the preceding year, 1819, from February to June, twenty-seven patents were taken out; and

in the year 1815 fifty eight ; and in the succeeding year to the law coming into operation, one hundred and seven.

Have you any information to afford the Committee with respect to the patents in America ?—The information I would offer is, that I published in America, thirty years ago, a view of the real nature of the law of patents, and objected to the patentee being charged any thing for the expense of having his exclusive privilege secured to him ; and there the whole expense at that time, and the same expense now, is 30 dollars (6*l.* 15*s.* sterling.) I found many cases where poor men had found out an invention, and spent the whole of their money in bringing the invention to perfection, to whom it was felt a grievance, and I pleaded the cause of the poor in the public papers at that time, and since my arrival in England I have not seen any reason to alter that view. It seems to me that the great bulk of inventors are poor, and that they generally expend all their means in bringing their invention to perfection, and having so expended all their means, they cannot take out a patent unless they can find a monied man to produce funds ; I have frequently undertaken to bring monied men and inventors together on that score, and have rarely succeeded in bringing them together, because the inventor is afraid to disclose his invention for fear of losing it ; and the monied man is afraid to embark any money in it, because he cannot know the invention, and the negotiation has generally failed on that ground.

Is it not commonly known among men of science, commonly considered as almost a proverb, that few men who are patentees ever reap the advantage of their own ingenuity ?—I consider it almost proverbial ; and I consider the expense of the patent is one cause of that state of things ; I conceive the consequence of charging any considerable sum for patents is, that none but bold speculators take a patent, and hence it is that so few prove profitable : and my view is also, if patents were given free of cost, the public would be benefited by the inventions of the cautious and sober-minded, and thus a source of permanent wealth to the country would be opened. I am well acquainted with many cases in which a poor inventor has remained poor, while the capitalist has realized a great fortune by the invention, because the invention could not, before being patented, be shown to persons competent to judge of its value. I have been for more than thirty years in the habit of being consulted confidentially by inventors in England, France, America and Austria, and I have prevented a great number of patents being taken in England and France, by laying before the parties the difficulties they would be likely to meet with, in negotiating with men of capital prior to taking a patent. I firmly believe I am,

at the present moment, the confidential depository of important inventions, which, if they could be patented free of cost, and thus become marketable commodities, they would immediately occasion employment to thousands of people, and I have no doubt many other engineers could say the same. I know of several instances of valuable inventions having been lost to the public by the death of the inventors, when if the parties could have been made secure, they would have treated with capitalists, and the inventions probably have become important staple articles of manufacture. Within these two hours I have been consulted upon the subject of a rotatory steam engine ; the inventor has kept it to himself forty years, and has not shown it to more than one or two persons ; I was consulted by a capitalist, a gentleman who will advance the money for the patent, if I will give a favourable opinion of it when I see it, and I am to see it to-day. Having extensive acquaintance with men of invention and men of capital, I undertook many years ago to act as agent between the two classes, but was very rarely able to bring the negociation to a satisfactory conclusion, principally owing to the costs of the patent ; and indeed I do not recollect that I ever succeeded in such a negociation, without taking upon myself the serious responsibility of recommending the invention, which recommendation common prudence generally hindered my given, even when I thought highly of the invention ; and finding, from much vexatious experience, that such negociations tend only to waste the time of all parties, I have for some time declined attempting to bring capitalists and inventors together. I would propose patents to be put upon the same footing as copyrights, or rather as statuary ; there is an Act for the protection of artists in forming statuary. I would just draw a parallel between an artist and an inventor : if I take a piece of clay, and model the likeness of a human head, or any other form that my fancy may dictate, and cast a copy of the same in plaster of Paris, I have a patent or exclusive right to sell copies of it, by merely putting my name and date of publication upon each copy ; but if I take the same piece of clay, and spend the same time on it and model a useful article, a tea-pot for instance, and cast it in metal, I must pay from 100*l.* to 400*l.* for a patent for that article, which I consider a hardship. I would propose that the publication of any new discovery should constitute the evidence of exclusive right, and that the publication should consist in sending to certain offices written or printed copies of the specification, attested by the signature of the inventor, and also advertising for sale copies of the same for a reasonable price, in a certain number of newspapers ; and I would argue, that the placing patents on that footing would

tend to prevent monopoly, by opening a wide door to competition. It is apprehended by some, that the great increase in the number of patents which would be the consequence of throwing off all the fees, would occasion so much litigation as to become a great public inconvenience; my view is, that this evil, if it should be found to exist in the early stage of the change, would soon correct itself, because every trial of a patent cause would tend to enlighten the public mind, and enable persons to decide many critical points without an appeal to a court of law; it is very probable, that more litigation would be generated by the increase of a thousand ships employed in the commerce, than the increase of a thousand patents; but who would imagine that an addition of a thousand ships employed in the commerce of the country would be a public inconvenience? My argument would go to show, that a great increase of litigation would not be likely to take place, from the reason I have given; and that numerous disputed rights to inventions are, and would be continued to be settled by the knowledge of the parties themselves, or by the explanation of scientific friends and others, and a small portion only would come into court, as containing points of great difficulty. I would wish to give my opinion, that the greatest encouragement ought to be given to every species of invention. Should difficulties on the score of vested rights in fees, prevent exclusive privileges free of cost, the Austrian patent law may afford a model for raising a sufficient sum for compensating the possessors of such rights, without much oppressing the poor inventor. The whole costs of a patent in the Austrian Empire, including a population of thirty two millions, is 42*l.* 10*s.* for fifteen years, which is paid by annual instalments, beginning with 1*l.* a-year for five years, then rising ten shillings a year, and ending with 6*l.* for the fifteenth year.

Have you turned your attention at all to the difficulties arising from disputes upon patents?—I have had a good deal of experience, and been in court very often.

Do you consider that the patent system is ill adopted for decision?—Yes, because juries are generally totally ignorant upon the subject: if a special jury of men conversant with the subject was summoned, I should conceive the present system might be preferable to any board of commissioners; it would give more public satisfaction than any board of commissioners.

Is not a special jury necessarily a very expensive mode?—It increases the expense not a great deal; if it is a chemical patent it should be a jury of chemists.

Could you suggest any mode of getting a jury of that character in such cases?—I do not know that I could.

Did you ever consider the project of a commission?—Yes, I have considered it, and I think it attended with very great difficulty; I do not see how a commission can give satisfaction.

You think there would be too much jealousy?—It would be difficult to find commissioners who were not, some how or another, connected with the manufacture of the article that might come before them.

Might not the same objection apply to a jury; is it not probable that the persons selected would be interested in some way, or have a preconceived opinion upon the subject?—It would not apply so strongly as to a commission; in a commission there would not be more than five persons, perhaps; and upon the jury there would be twelve, and there would be less objection.

Would you have an equal objection to a commission, supposing the parties had the power of challenge?—Not so much in that case.

Do you think it would be possible to bring parties together to any scheme of arbitration?—I should think that arbitration would be better than a commission.

Do you think you could bring parties together before an arbitration?—It is now frequently done; I know of several patent questions settled by arbitration, and by the modern mode of arbitration much time is saved; it used to be that each party chose an arbitrator, and the two arbitrators met together and canvassed the subject; each arbitrator pulling to an opposite point, until they became two enemies. I have seen that repeatedly, and in that state of the case a third is chosen as an umpire, then all the arguments are to be gone over again by those two arbitrators as counsel, and the umpire as judge; the modern practice is an improvement upon that, as the third arbitrator is chosen before any discussion takes place, and the three arbitrators meet and hear the question at once; each of the arbitrators are judges, and they do not mix up their own passions in the thing, and the decisions are come to much pleasanter by the three arbitrators at once.

You stated you objected to a commission; will you state what your view of a commission is to which you do object?—A set of men appointed, say five gentlemen appointed as a commission to judge of patents generally.

What would be your idea of five persons, men of science, being appointed to act both as jury and judge, constituting a court, and having before them the evidence brought in the same legal way, with advocates on either side as at present in court?—Provided such a commission were open to challenge, I should conceive that it would be a very useful mode of proceeding.

The question assumes that persons might be found above challenge for this commission ; do you not believe such men could be found ?—Yes, but I should doubt whether such men would, in the opinion of the losing parties be above suspicion.

They would not be worse off than with the Judges now, by your own act ?—No.

He is considered, in many instances, incompetent for a mechanical or chemical subject ?—Yes, he is.

Do you think, if the court had the power of ordering arbitration, it would be satisfactory to parties to have their cause so settled ?—That is generally more satisfactory than the verdict of a jury.

At present the arbitration can only be by consent ?—Yes, certainly.

Supposing the court ordered it, do you think it could be managed ?—Yes, I think it would be tolerably satisfactory to the great bulk of persons.

Would you be inclined, in that case, to leave to the judge the power of selecting the arbitrators ?—I think that that would not be likely to give satisfaction, unless there was some degree of choice, because the losing party would say the judge did not know, he appointed such a man of course.

Supposing they were made liable to challenge ?—If they were made liable to challenge it might answer the purpose.

You think, in that case, the parties would be likely to agree ?—Yes, they would be satisfied they had justice done them.

You were giving the Committee some information as to the American law, are you aware whether it is the practice there to lodge models of the inventions in the patent office ?—It is not absolutely necessary, it is desired, and they rather favour the lodging of models ; but the law does not render it absolutely necessary.

Supposing that part of the American system were introduced into this country, do you think inventors would frequently avail themselves of the power of lodging models in any public office for the purpose of an easy determination of disputes ?—I should think a great number of models would be lodged ; but I do not conceive it possible to oblige them to lodge models, because some things are not capable of being shown by model.

Do you not suppose it would conduce very much to the easy determination of disputes arising upon those questions ?—Very much.

Would it not lead very much to piracy ?—It might in some degree.

Are the specifications sealed now in America ?—No.

Were they under the old law ?—Yes, in 1790.

Do you know how it worked?—Very disadvantageously.

Can you state how?—The public were not able to know whether a person had a patent or not; a man asserted he had a patent, and there were no means of knowing whether he had or not; a great deal of unfair practice was suspected, but could not be proved.

Do you remember any case of a man working upon another's patent, and what was the result?—I have known a patent worked under a concealed specification; another person has also worked against the patent, and the patentee has determined not to go into court on the subject, and has suffered the infringement because he would not have his specification unsealed.

Is the law of patents the same in all the States in America?—Yes, it is one law in all the States.

One law includes the whole?—Yes; there is one point as to the time of lodging the specifications. I should conceive, for various reasons, the specification should be the first thing, as I believe it is in all countries except England; in America the specification is the first thing presented; also in Austria, France and Holland.

Does it completely detail the invention?—A perfect description of the invention.

Would you not allow the inventor to amend his specification?—That is allowed in all those countries.

Is the specification made out at the time of the application? Yes, at the time of the application in all countries but England. I have assisted a number of the inventors in preparing their specifications, and I have found that an inventor, as soon as he has his first idea, if he has money, runs away and takes his patent out under a general title, and when he comes to specify, he has only a parcel of crude ideas, which it is most difficult to form together to meet his title.

The Committee have been told, it would be exceedingly difficult to form a specification upon the first application?—If you force the inventor to give a specification, he must give due consideration to the whole of his scheme in order to be able to describe it, and you will then have much more perfect inventions than you have now: when you give him time to prepare a specification, he will perfect his ideas before he embarks his money.

You do not think any great inconvenience would accrue to an inventor from being compelled to make out his specification on his first application?—No, I think it would be conferring great benefit in compelling him to perfect his specification.

You would allow him to amend after the delivery of his specification?—Yes.

Not after taking out the patent?—Yes, at any period of the term, but not to lengthen his term by so doing; the same as in France and Austria, they can add to their patents at any time, but the term is not prolonged by it; it might be a serious consideration whether the specification should be published so soon, before every thing is completed.

Are you in favour of having the specification always open?—Yes, always; I found great complaints in Austria. I have been during the last eighteen months in Vienna, and I found great complaints on account of sealed specifications; it is felt as a grievance there now; by mixing with scientific people, I found it continually spoken of as a grievance.

In what way?—They cannot know whether a man has a patent or not; a man asserts he has a patent; he has a patent for something under the name and title as published, but the public have no means of knowing, except by instituting a suit.

What would be the result of that suit in Austria, if it was found a person was actually working upon a specification of a patentee?—I do not know the penalty attached.

What has been the result of any one who has been so prosecuted?—I do not recollect.

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**Arthur Howe Holdsworth, Esq. a Member of the Committee ;  
Examined.**

Do you know of any case that has been compromised on an agreement to prevent third persons from working?—I remember, some years since, when at Worcester, to have been shown the factory of a person who was making patent net; I had never before seen the thing in progress, and was rather inquisitive of the man as to its details; he told me he was working upon the plan of a Mr. Heathcoat. I asked him upon what terms they worked; he said, “we pay so much per frame.” I said, I thought there had been an action brought upon the subject, and that Mr. Heathcoat’s patent had been destroyed; he said that it was carried into court, but the case was compromised; they had no doubt that the patent would have been destroyed, but it was deemed wiser by the trade not to proceed, provided he would undertake not to license above a certain number of those frames, so that the trade might not be too much extended, and induce too great a number of hands to enter into it; and, as well as my memory furnishes me, I think it amounted to about 500.

Do you think it would be expedient to give permission to parties to lodge models at some public office?—I conceive that the only effect it would produce, would be enabling trades per-

sons, who took out patents for some particular articles of their own manufacture, to give it publicity ; I conceive, for other purposes, patentees would rather object to it, because it will afford facility to the public in discovering the mode by which the patentee effects his purpose, which never perhaps would have been thought of by such party if he had not so seen it ; a very dangerous matter, as the feeling of the public at present exists with respect to patentees, which are deemed fit persons to be plundered, and which I would thus exemplify : I had occasion myself to call upon some parties who were, as I believed, pirating a patent in which I was interested ; whilst we were talking upon the subject, one of the party, a man in one of the first houses in England, coolly told me that my patent was good for nothing, and that we could prove it, if he went into court, adding, as if to confirm his position, that he had already spent in one instance 10,000*l.* to destroy another man's patent ; a proof, I conceive, that nothing can be more dangerous than to oblige a patentee to expose more of his specification to the public than is necessary, while such feeling with regard to patents exists ; for if it required 10,000*l.* to destroy the patent, it must at least have had a pretty good title, or it could not have been so well defended as it should seem it must have been.

[To be continued.]

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A Practical Treatise of THE LAW OF PATENTS FOR INVENTIONS. By Edward Holroyd, Esq. Barrister at Law, Commissioner of Bankrupts. London. John Richards. 1830.

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THERE are many strong contrasts in the world, but there are few stronger than that which exists between law books and law deeds.

Lawyers are at once the clearest, and most obscure, the most dense, and most verbose of writers ; obscure and rambling when they wish to bewilder their adversaries, or astonish their clients, pithy and clear when instructing their brethren or arguing before judges, they can, like the Cromwell of Sir W. Scott, at pleasure make many words with few ideas, or many ideas with few words. A legal instrument to the uninitiated, is a perfect Babel or confusion of tongues ; a well written law book is to any man of common judgment and

attention, a perfect model of an abstract ; clear, dense, methodical, compressing the greatest possible number of ideas into the smallest possible space.

The business of a legal writer we take to be this , to explain the origin and intent of the common and statute law ; to collect from the decisions and opinions of judges, the sense in which the law is to be taken, and the modifications that time and various states of society have brought about in its application ; to deduce carefully from all these, rules of practice ; to be sparing of his own opinions and full in citing high legal authorities, to the end that the reader may know what the law is, and how it is read, and that he may thence judge soundly of its bearing upon the cases that come before him.

To execute well such a task requires little originality of thought, but great industry and power of selection, and a clear but brief and unadorned style ; these are the most essential qualities in a legal writer, and to judge of Mr. Holroyd by his present work, he is not deficient in them. His exposition of the Law of Patents is methodical, clear, and concise, and he has taken care to draw all his conclusions from the judgments of the Courts in important cases, extracting the pith of the arguments on particular trials, and the reasons of particular decisions, in order to apply the doctrines laid down in them to classes of cases.

The book is divided into nine chapters, of which the first is an introduction, treating of the common law respecting monopolies ; the foundation of the Patent Law in the famous statute 21 James I., c. 3 ; and the several acts that have been past within the last 120 years for the copyright of books, prints, and busts. This chapter is interesting, as being a brief sketch of the origin of Patent Law, and is necessary to the completeness of a treatise, but we do not perceive that it has much bearing on the actual practice, and we presume the author was also of this opinion, for he has made it exceedingly brief. The second chapter dives into the subject matter, and

treats “Of the nature of the invention for which a patent may be granted.” On this Mr. Holroyd says, “The invention for which a patent may be granted must be a manufacture. The manufacture must have two qualities. 1st. It must be new as to the public use and exercise thereof in England. 2d. It must be useful to the public.” And further, “Whether an invention be new and useful, is a question of fact proper for a jury. But it may safely be laid down, that whatever be the nature of the invention, whether the merit of it rest on discovery, or on improvement, novelty and utility must exist in a material degree. And if an invention consist in an improvement upon any thing, and that which constitutes the improvement be known, and has been applied before to a similar purpose, though never applied before to the specific thing which the patentee has applied it to, it will not possess sufficient novelty to be the subject of a patent.”

It is impossible to define what is absolutely the law on this subject, because it is impossible to define the exact quantity of novelty and utility requisite to support a patent; Mr. Holroyd has however enabled the reader to form a tolerably clear idea of the feeling of the Courts, (or the tacit rule by which their judgments are guided), by a judicious selection of the opinions of Judges in various marked cases.

He is very full on the much argued point of the construction given to the word “manufactures,” which he says according to the construction given to the statute, may be divided into two classes ;—

“ I. Things made.

II. Practice of making.”

He classes things made into,

“ 1. *A thing made which is useful for its own sake, and vendible as such, or some part of such a thing;*

“ As a medicine, stove, carriage, &c. &c.

“ 2. *A piece of mechanism, engine, or instrument for producing either old or new effects, by being employed to facilitate*

*tute or expedite the labour of the making of some previously known article, or in effecting some useful purpose; or a new part of such machine, engine, or instrument, whereby it is rendered more efficacious;*

“ As a lace machine, stocking frame, &c. &c.

“ *II. Practice of making; or principles carried into practice in a new manner, or new result of principles.*”

This second head is divided into,—

“ *1. An artificial manner of operating with the hand, or with instruments in common use; or a mode of employing practically art and skill, producing an effect useful to the public; or an improvement in any known manner of so operating or employing practically art and skill.*

“ *2. A process, or combination of processes, in any art, producing an effect useful to the public;*

“ *Or an improvement in a process, or combination of processes, in any art, producing an effect useful to the public.*”

This is the most extended construction that has been given by Courts to the word “ new manufactures,” and Mr Holroyd supports it by citing many authorities, especially the elaborate judgment of Lord Chief Justice Eyre, in *Boulton v. Bull*, which is in itself a treatise on the subject.

We have often heard it said that the Judges are not at all agreed upon the meaning of the words “ new manufactures,” but we incline to think that the apparent discrepancy of their decision, is not in the view taken by the Judges, but in the misapplication of the terms used by patentees, and in the wilful obscurities of counsel, and Mr. Holroyd’s exposition of the subject strengthens in us that impression. The Judges have differed as to the accordance of the words used carelessly by patentees, with the meaning of the word “ manufacture,” but they have rarely differed in their estimate of whether the thing invented really was or was not a manufacture. The brief but pithy definition of the Court in *the King v. Wheeler*, (cited by Mr. Holroyd) is thus; “ Something of a corporeal and

substantial nature, something that can be made by man from the matters subjected to his art and skill, or at the least, some new mode of employing, practically, his art and skill, is requisite to satisfy this word (*manufacture*).” This idea is at the bottom of most of the opinions delivered by the Judges themselves.

But to resume our analysis, chapters 3 and 4 are “On the person to whom and for what time a patent may be granted.” And on the forms of soliciting a patent and inrolling the specification. These chapters contain the rules of law and the official practice in such matters, the forms being given in an Appendix.

Chap. V. treats of a very important part of the law, viz. the patent and the denomination or title of the invention contained therein ; the specification, and the rules of construction applicable to the patent and the specification. Mr. Holroyd has fully appreciated the importance of impressing upon his readers the law as to the denomination of the invention in the patent, and he cites abundance of cases which shew the absolute necessity, that the title or denomination should be strictly correct, expressing the invention neither more nor less than it really is ; and that it “should state in substance what is set out in detail in the specification.

“ If the patentee (he says, quoting the Court in *Rex v. Wheeler*) has not invented the matter or thing of which he represents himself to be the inventor, the consideration of the royal grant fails, and the grant consequently becomes void ; and this will not be the less true, if it should happen that the patentee has invented some other matter or thing, of which upon a due examination thereof, he might have been entitled to a grant of the exclusive use.”

And further, “ A patent cannot extend beyond the consideration ; and the consideration being entire, if it fail in any part, the patent is void *in toto*.

“ If, therefore, a person applying for a patent state that he

has discovered improvements in two things, and obtained a representation patent for two, and it should turn out that there is no novelty in one, the patent fails ; and the reason is, that as the patentee claims the merit of having invented two things, the discovery of the two forms the entire united consideration for the grant, and the advisers of the Crown may think the two the proper subject for a patent, (the granting of which is matter of favour on the part of the Crown, although the thing be new in every particular,) when they might not have recommended the grant of a patent for each *per se*. The Crown is considered as deceived by the representation."

The operation of this extreme severity of the law as to the denomination of the invention and the accordance therewith of the specification, is very fatal to patentees, because it is often impossible for the utmost intellect and foresight, so to frame the denomination of an invention, at the time of applying for a patent, as to ensure that it shall exactly represent the invention, and that the specification shall exactly accord with it.\* Nevertheless such is the law, and it is therefore very desirable that inventors and their advisers should be thoroughly imbued with the knowledge of it, for it is one of the points on which they are apt to be the most lax, imagining that they may give what title they please to an invention, and that they will be judged by the specification. On the specification Mr. Holroyd is equally sound and clear, and has shewn great judgment in his selection from the cases that he has brought to bear upon his explanations of the law ; indeed the whole of this fifth chapter is admirably drawn up ; it is however a melancholy catalogue of dangers for inventors, but for that very reason it should be carefully studied.

The remainder of the book is devoted to the consideration

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\* The origin of the law may be traced to an old Statute of 1 Henry IV., c. 6, which was made for patent grants of lands, and not at all for patents of invention. It is not wonderful that a law made for one thing, and applied to another, should oftentimes have a bad effect.

of the property in patents, viz., the assignment of a patent ; the granting of licences, the extension of patents, the infringement of patents, the nature of evidence required and admitted on trials, on injunctions in equity, and repeal and surrender of a patent.

Much of this latter part is formal, and the remainder almost exclusively legal ; hence not being ourselves lawyers, we hardly feel competent to pronounce decidedly upon its merits. We find in it however the same methodical arrangement of materials, and the same brevity and clearness of style which mark the former part of the work ; and from the judgment and care with which Mr. Holroyd has executed that part, we should be induced to put confidence in the soundness of the remainder. The appendix contains various forms referred to in the body of the work, viz., the forms of soliciting a patent, the patent itself, specification, licence, form of petition for extension, &c. &c.

The chief characteristics of Mr. Holroyd's work are, method and condensation ; hence without being voluminous, it contains a great quantity of information, and will prove, we doubt not, a valuable publication to students and inventors. We cannot however suffer the work to pass with our unqualified approbation. A decided want will be perceived at the end of each section, of a general summary, or definition of the law ; a resolution of all the detached rules, drawn from particular decisions, into some fundamental rule or principle of judgment, which is at the root of them all, and is the essence and spirit of the law.

We are not aware that this has been done in any other treatise on the same subject, but that is a reason why Mr. Holroyd should have done it. It is true men of judgment can form conclusions for themselves, but Mr. Holroyd professes to write for the public, that is, inventors as well as lawyers, and the public does not consist generally of men capable of drawing accurate conclusions on such abstruse points as the laws of patents.

## List of Patents,

*Granted by the French Goverment between the 1st of January,  
and 31st of March, 1830.*

- To Messrs Gensse, Dunning, and Co. Amiens, for the manufacture of a new kind of cloth, called *drap d'Alep*. 5 years.
- Libel, Charles, Thomas, Upholsterer, Paris, for making gilt nails, called *sixtes*. 5 years.
- Bazy, Jean, Chemist, St. Omers, for making paper from the remains of the pulp of beet root. 5 years.
- Hall, Edward, Engineer, Paris, for a new method of fixing hydraulic wheels, applicable to water falls, variable in their level. 15 years.
- Ourselle and Roberts, Plaster Manufacturers, Pantin, near Paris, for a cast iron apparatus, applicable to ovens, built of common plaster. 10 years.
- Sorel, Watchmaker, and Gagnau, Lamp Manufacturer, Paris, for a constant level lamp, which is supplied with oil from below. 10 years.
- Brot, Alexandre, Cyrille, paper maker, and Stationer, for a port folio with inkstand. 5 years.
- Bellemére, Francois, Paris, for a cock for decanting liquids. 5 years.
- Dauptain, Son and Sister, paper stainers, Paris, for a method for making hot pressed papers. 5 years.
- Saint Martin, Jean Baptiste, Paris, for a machine for taking off the gloss from cloth and stuffs. 5 years.
- Eno. Salmon, and Yvart, Pavie and Jourdain, manufacturers, Paris, for a stuff for furniture, the pattern of which is on both sides of two different colours. 10 years.
- Lenoir, Barnabé Antoine, Paris, for a method of making, preserving, and transporting ice, and of applying it to several useful purposes. 10 years.
- Houeix, Jean Baptiste, Apothecary, Paris, for manufacturing white chocolate. 5 years.
- Houssard, Michel, Marie, Eugene Francois, Paris, for a machine for stamping copper kitchen utensils. 10 years.
- Carpentier, Antoine, Alfonse, straw hat manufacturer, Paris, for a new straw hat. 5 years.
- Duvergier, Anné and Bordége, Hilarion, engineers, and machinists, Paris, for a process, and apparatus, for drying in a short time timber for building and other objects. 15 years.
- Jaillet, Jeune, Claude, pattern drawer, Lyon, for a machine for making figured stuffs. 15 years.
- Brook, Jonas, manufacturer, Manchester, for a machine for spinning cotton, &c. 15 years.

To Cochaux, engineer and machinist, Liege, for an apparatus for preventing and even rendering impossible, the bursting of boilers of both high and low pressure. 15 years.

— Callier, Emmanuel, tinman and lamp manufacturer, Paris, for a lamp socket, with double air holes, or current of air. 5 years.

— Sterlin, Louis, Charles, ironmonger, Paris, for a new kind of lock. 10 years.

— Sainte, Chapelle, Jean Baptiste, Francois Pascal, Paris, for an hydraulic apparatus, called a *trombe d'Eau*. 10 years.

— Delarne, Jean Baptiste Edouard, Caen, for a syringe, a *ressorts*, with springs. 10 years.

— Richefew and Fleschelle, bakers, Paris, for a kneading machine. 15 years.

— Langlais Quignolot, purse manufacturer, Paris, for a new stitch in making purses, called the *Point de tulle* or *point à jour*, made by a machine. 5 years.

— Best, Constance, Paris, for an hydraulic engine. 15 years.

— Sterling Jeune, Francois, locksmith and mechanic, Bordeaux, for an improved locomotive power, applicable to navigation. 15 years.

— Hermann Stinnes, miller, Strasbourg, for a peculiar method of cutting the grooves in millstones, from the quarries of Andernach. 15 years.

— Serbat, Louis, chemist, Paris, for improvements in charcoal for sugar refiners. 15 years.

— Francfort, Théophile, David, Paris for a method of flattening a mixture of brass and pewter, or bronze, and of employing sheets of bronze for sheathing ships. 16 years.

— Robert Alexis, coach builder, Paris, for a system of stage coaches, called *articulées*. 15 years.

— Coffin, Francois, mechanic, Boston, for a machine and the application of cutting instruments, called *helicoides*, for removing from the skins of animals the hair or fur for hat making. 10 years.

— Messrs Payen, Lecerf, and Didier, chemists, Greuelle, near Paris, for a new method of making animal black. 10 years.

— Maller, Guillaume, Paris, for an instrument, called a *cosmophore*. 10 years.

— Courtet, Auguste, mechanic, Lyon, for a new method of glossing silks, stuffs, &c. called *crepage velu*. 10 years.

— Gougeon, Jacques César, bleacher, St. Didier, for a covered drying machine, for bleaching linen. 10 years.

— Rotch, Benjamin, Paris, for an economical method of making soap. 10 years.

— Lupé, Pierre Auguste, Paris, for a method of restoring to

animal black which has been used in refining sugar its original qualities. 10 years.

- Nepven, Augusta Nicolas, bookseller, Paris, for a panorama, called the *panorama de salon*. 5 years.
- Mijevre Vergor, Jean Baptiste, physician, Marseille, for a process to be used instead of nut galls in dying. 5 years.
- Thomas, Augustin, Joseph Fortune, horse hair stuff manufacturer, Paris, for a method of taking raised velvet drawings on horse hair stuffs, and straw. 5 years.
- Pingret, Joseph Amont, engraver, Paris, for a die, composed of several pieces of steel. 5 years.
- Langrenez, Augustine Louis, piano-forte maker, Paris, for improvement in pianos. 5 years.
- Chevalier Curt, Esprit, artificer in fireworks, Paris, for a portable cast iron furnace. 5 years.
- Messrs. Edward and Affre, Bordeaux, for a soap called Savon de Cachemire. 5 years.
- Paque, Jaques Francois, Etienne, apothecary, Orleans, for a method of keeping dry the teats of cows destined to rearing infants artificially. 5 years.
- Tremblot, Joseph Thomas, Paris, for a machine for making brass capsules in one piece, and several at once, for priming detonating guns, &c. 5 years.
- Conty, Alexandre, miller, La Haye Descartes, for a new hopper for flour mills. 5 years.
- Bowin, Jean, mechanic, St. Etienne, for a mechanical batten for making ribbons. 5 years.
- Anjard, Etienne, Paris, for a complete artificial head-dress, which may be kept on by means of springs and pins. 5 years.
- Roth, Louis, Paris, for a process and apparatus for preparing syrups without loss. 15 years.
- Josselin, Jean, Julien, laceman, for improvements in corsets, by means of which they may be laced or unlaced at pleasure, without aid. 5 years.
- Pionnier, coke manufacturer, Paris, for a process for preparing the stone for making plaster of Paris, by means of hydrogen gas, and other improvements. 15 years.
- Lahore, Jean, Baptiste, Paris, for a mechanical kneading machine, called *Lahorides*. 10 years.
- Guy, Brothers, Pierre Gabriel and Jean Pierre Ansalme, Paris, for a machine for making bread. 15 years.
- Monet, René, Paris, for an apparatus and process for making coke, preparing plaster of Paris, and making animal black and glass. 15 years.
- Lasgoseix, Etienne, engineer, Paris, for divers mechanical kneading troughs. 10 years.

To Papillon, Paris, for a method of public advertisements, by means of frames, &c. &c. 10 years.

— Newhaus Maison Neuve, Paris, for a mechanical apparatus for the use of bakers, called the *Pétrisseur Automate*. 15 years.

— Ferry, Jean Nicholas, mechanic, Paris, for improvements in the *Quintenz* portable scales. 5 years.

— Ferraud, Pierre, Paris, for a mechanical kneading machine. 5 years.

— Messrs. Barth, Hardy, and Faveers, Paris, for a combination of springs, adapted to carriages, elastic beds, &c. 10 years.

— Benard, Nicholas Etienne, Paris, for an apparatus for evaporating liquids by steam. 5 years.

— Messrs. Blanc and Conville, Paris, for a method of raising or lowering water by means of steam engines, &c. 15 years.

— Blanchard Just. Louis, colour manufacturer, Paris, for a yellow, red, and brown colour, to replace those of Italy. 10 years.

— Boutigny, Antoine, apothecary, for a syringe, called *plongeante*. 5 years.

— Collier, John, engineer, Paris, for a machine for napping cloth. 5 year.

— Messrs. Drevon, Boudon, and Desboides, Paris, for a method of carbonizing turf. 5 years.

— Dumontier, Bon. Pierre, lime manufacturer, Pantin, for a method of curing plaster of Paris with pit-coal. 5 years.

— Fortin, Pierre, distiller, Paris, for a digester and furnace, called *Hydraulique*, for cooking meat and vegetables. 10 years.

— Godin, Jean. Francois, manufacturer, Sceaux, for a travelling carriage, called a *messagerie économique*. 15 years.

— Guérin, Jeune, Pierre, merchant, Nismes, for a distilling apparatus. 10 years.

— Haentzeus, merchant, Paris, for a machine called *porte-encre auxiliare, ou port couleur*, for applying ink mechanically to printing presses, and colour upon stuffs or paper, &c. 5 years.

— Joline Dubois, and Co. and Rony, Nantes, for reducing ivory black to its original state, after having been used in refining, and for carbonizing turf. 10 years.

— Marti, Emily, Smith, Fourchambault, for a smelting process. 10 years.

— Netster, Ernest Auguste, and Fromm, Frédéric, Strasbourg, for a tissue made from the stumps of feathers, for making hats, necklaces, bracelets, baskets, &c. 5 years.

— Neuville, André, Mechanic, Bordeaux, for a machine for

putting in motion a carriage, boat, mill, &c. by the force of men or horses. 10 years.

- Renaud de Vilbach, Alfonse, Ernest, Bernard, Maximilian, Montpellier, for an iron rail-way. 15 years.
- Messrs. Seguin and Co. engineers, Lyon, for a new invention for boilers of steam engines, by means of isolated pipes, through which the steam is made to circulate. 15 years.
- Sirot, Son, nail maker, Valenciennes, for making zinc nails by machinery. 15 years.
- Talbot, Pierre Désiré, cloth manufacturer, Louviers, for a machine called *table hydromanostatique* and *manostatique*, for a new method of dressing cloth. 5 years.
- Tellier, Nérée, goldsmith, Paris, for an improved axle-tree, called *essieu Tellier*. 10 years.
- Tezier, Jaques François, Sorgues, for a spinning machine, and other improvements. 10 years.
- Triaux, Antoine, lamp manufacturer, Orleans, for a new synombra lamp, in which the oil is kept constantly on a level with the wick, by means of a piston, &c. 5 years.
- Accard, Stanislas, Paris, for a machine for making wire nails and tacks. 15 years.
- Chaussenot, Jaques Bernard, Chaillot, for an apparatus against smoking chimneys. 10 years.
- Chaussenot, Bernard, engineer and aliette, Paris, for improvements in lighting by oil. 10 years.
- Chrétien, Claude, and Sourd, Louis Charles, silk manufacturers, Lyon, for a machine for making ribbons, and larger plain stuffs. 5 years.
- Guibal and Ratier, Paris, merchants, for a method of reducing carst-chouc, or india-rubber, into threads, and making waterproof stuffs thereof. 15 years.
- Laroche, Philippe, Paris, for an economical cooking apparatus, called *cuisine des Dames*. 5 years.
- Morgan, William, London, for improvements in steam engines. 15 years.
- Mulot Louis George, mechanic, Epinay, for improvements in the method of adjusting iron pipes. 10 years.
- Pwquewr, Onésiphore, Paris, for improvements in steam engines. 15 years.
- Zeler, Potter, Près St. Gervais, for improvements in preparing plaster of Paris, by means of an oven, called *Zelerien*. 15 years.
- Wall, Jaques, Tinman, and Laveleye, Charles, engineer, Paris, for a new level lamp, called *lampe Chimique*. 10 years.
- Demarne, André Germain Victor, for improvements in stocks and shirt collars. 5 years.

To Ducret and Bouvet, Besançon, for a clock regulator. 5 years.

— Chauvin Chabot, Antoine, Emmanuel, Cæsar, of Mans, for an instrument for instantaneously loading fire-arms, called chargeoir accéléré. 10 years.

— Adam, Gaspar, Zacharie, Montpellier, for a distilling apparatus. 15 years.

— Oilleaux Desormeaux, Paris, for a moveable vice, called in the trade *a genou*. 5 years.

— Pimont, Pierre Prosper, printed calico manufacturer, Darneval, for a method of preparing dyed or undyed wool for spinning, without the aid of oil. 5 years.

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### **New Patents Sealed, 1830.**

To Robert Hicks, of Conduit Street, in the parish of Saint George Hanover Square, in the county of Middlesex, surgeon, for his having invented or found out an economical apparatus or machine, to be applied in the process of baking, for the purpose of saving materials.— Sealed 26th June, 6 months, for Inrolment.

To Edward Turner, of Gower Street, in the county of Middlesex, M. D. and William Shand, of the Burn, in Kincardineshire, in that part of the United Kingdom, called Scotland, Esq. for their having invented a new method of purifying and whitening sugars, or other saccharine matter. 26th June, 6 months.

To Moses Poole, of Lincoln's Inn, gentleman, in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of certain improvements, in the apparatus used for certain processes of extracting molasses or syrup from sugar.—26th June, 6 months.

To Samuel Parker, of Argyle Street, Oxford Street, in the county of Middlesex, bronzist, in consequence of a communication made to him by a certain foreigner residing abroad, and improvements made by himself, for an in-

vention of certain improvements in producing mechanical power from chemical agents.—29th June, 6 months.

To Samuel Parker, of Argyle Street, Oxford Street, in the county of Middlesex, bronzist, in consequence of a communication made to him by a foreigner residing abroad, and improvements made by himself, for an invention of an improved lamp —1st July, 6 months.

To Richard Roberts, of Manchester, in the county of Lancaster, civil engineer, for his having invented or found out a certain improvement or certain improvements in the mechanism employed to render self acting the machines known by the names of Mule, Billy, Jenny, Jack frame, or Stretching frame, and all other machines of that class, whether the said machines be used to rove slub, or spin cotton, or other fibrous substances.—1st July, 6 months.

To John Henry Clive, of Chell House, in the county of Stafford, Esq. for his having invented certain improvements in the construction of and machinery for locomotive ploughs, harrows, and other machines and carriages.—1st July, 6 months.

To John Harvey Sadler, of Praed Street, Paddington, in the county of Middlesex, engineer, for his having invented certain improvements in looms.—1st July, 6 months.

To Matthew Uzielli, of Clifton Street, Finsbury Square, in the county of Middlesex, gentleman, in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of improvements in the preparation of certain metallic substances, and the application thereof to the sheathing of ships and other purposes.—6th July, 6 months.

To John Surman, of Hounslow Barracks, in the county of Middlesex, lieutenant and riding master, in the Tenth Hussars, for his having invented certain improvements on bits, for horses and other animals.—6th July, 2 months.

To William Wedd Tuxford, of Boston, in the county of Lincoln, miller, for his having invented a machine or apparatus for cleansing or purifying wheat, grain, or other substances.—6th July, 6 months.

To Edward Cowper, of Streatham Place, in the county of Surrey, and Ebenezer Cowper, of Suffolk Street, Pall Mall, East, Westminster, in the county of Middlesex, engineers, for their having invented certain improvements on printing machines.—19th July, 6 months.

To John Rawe, jun. of Albany Street, Regent Park, in the county of Middlesex, (being one of the people called Quakers,) and John Boase of the same place, gentleman, for their having invented certain improvements, in steam-carriages and in boilers, and a method of producing increase draft.—19th July, 6 months.

To Thomas Bulkeley, of Albany Street, Regent Park, in the county of Middlesex, M. D. for his having invented certain improvements in propelling vessels, which improvements are also applicable to other purposes.—19th July, 6 months.

To William Taylor, of Wednesbury, in the county of Stafford, engineer, for his having invented certain improvements on boilers and apparatus connected therewith, applicable to steam engines and other purposes.—19th July, 6 months.

To Edward Riley, of Skinner Street, Bishopsgate Street, in the county of Middlesex, brewer, for his having invented certain improvements in the process and apparatus for fermenting malt, and other liquors.—19th July, 6 months.

To George Oldland, of Hillsley, in the parish of Hawkesbury, in the county of Gloucester, clothworker, for his having invented or found out certain improvements in the machinery or apparatus for shearing and dressing woollen cloths and other fabrics.—22nd July, 6 months.

## CELESTIAL PHENOMENA, FOR AUGUST, 1830.

D.	M.	M.	S.		D.	H.	M.	S.	
1	0	0	0	Clock before the ☽ 6 m 1	15	10	0	0	☽ in conj. with ♀ in Leo
				Sec.	17	23	53	0	Eclipt. conj. or ☽ new moon
2	4	0	0	☽ in conj. with ♈ in Sagitt	18	0	0	0	☽ Stationary
4	0	57	0	Ecliptic opposition or ☽ full	18	18	0	0	☽ in conj. with ♀ in Leo
				moon.	19	6	0	0	☽ in conj. with ♀ long. 12°
5	0	0	0	Clock before the ☽ 5 m 43					in Leo
				Sec.					☽ lat. 0° 3' N. lat. 1° 7' N.
6	1	0	0	☽ in conj. with λ in Aquarius					diff. of lat. 1° 4'
6	10	0	0	☽ in conj. with φ in Aquarius	19	18	0	0	☽ in conj. with σ in Leo
8	9	0	0	☽ in conj. with ξ in Gemini	20	0	0	0	Clock before the ☽ 3 m 14
8	18	0	0	☽ in conj. with β Long. 17°					Sec.
				in Cancer. ☽ lat. 1° 45'	20	9	0	0	☽ in conj. with β in Virgo
				N. β lat. 1° 6' N. diff. of	21	0	0	0	☽ in conj. with η in Virgo
				lat. 39°.	21	11	0	0	☽ in conj. with λ γ in Virgo
9	3	0	0	☽ in conj. with ν in Pisces	23	3	0	0	☽ in conj. with σ in Leo
10	0	0	0	Clock before the ☽ 5 m 7	23	5	7	0	enters Virgo
				Sec.	24	8	0	0	in conj. with τ in Leo
10	6	0	0	☽ in conj. with μ in Ceti	25	0	0	0	Clock before the ☽ 1 m 59
10	20	8	0	☽ in ☐ last quarter					Sec.
11	2	0	0	☽ in conj. with δ in Taurus	25	6	0	0	☽ in conj. with γ in Libra
11	11	0	0	☽ in conj. with δ in Gemini	25	17	0	0	☽ in conj. with ψ in Libra
11	22	0	0	☽ in conj. with γ in Taurus	26	2	3	0	☽ in ☐ first quarter
11	23	0	0	☽ in conj. with α in Leo	26	9	0	0	☽ in conj. with φ in Oph
12	0	0	0	☽ in conj. with 1 δ in Taurus	28	5	0	0	☽ in conj. with δ in Cancer
12	0	0	0	☽ in conj. with 2 δ in Taurus	28	8	0	0	☽ in conj. with β in Virgo
12	5	0	0	☽ in conj. with α in Taurus	29	23	0	0	☽ in conj. with δ in Sagitt
15	0	0	0	Clock before the ☽ 4 m 17	30	0	0	0	Clock before the ☽ 34 sec.
				Sec.					

The waxing moon ☽.—the waning moon ☽

Rotherhithe. J. LEWTHWAITE.

## METEOROLOGICAL JOURNAL, FOR JUNE AND JULY, 1830.

1830.	Them.		Barometer.		Rain in in- ches.	1830.	Thermo.		Barometer.		Rain in in- ches.
	Hig.	Low.	High.	Low.			Hig.	Low.	Hig.	Low.	
JUNE											
26	76	55	29,72	29,63		11	65	42	29,82	29,63	
27	76	51	29,82	29,76		12	64	43	29,85	29,55	,075
28	72	52	29,84	29,79		13	71	41	30,09	30,05	,025
29	72	53	29,91	29,79	,025	14	77	43	30,09	30,00	
30	68	42	29,99	29,96		15	74	45	29,94	Stat.	
JULY						16	68	49	29,96	29,94	
1	71	47	29,91	29,76		17	66	42	29,99	29,86	
2	64	45	29,71	29,61	,45	18	63	56	29,81	29,76	,125
3	64	51	29,64	29,46	,1	19	69	50	29,98	29,89	,425
4	69	51	29,77	29,72	,15	20	67	51	30,05	30,04	
5	70	47	29,96	29,86	,025	21	75	51	30,15	30,09	
6	66	49	29,96	29,76		22	74	55	30,16	30,14	
7	64	55	29,61	29,56		23	76	57	30,08	30,06	
8	64	49	29,66	29,57	,025	24	77	60	30,06	30,01	
9	63	45	29,54	29,41		25	80	51	30,16	30,15	
10	62	48	29,82	29,66							

EDMONTON.

CHARLES H. ADAMS.





*SECOND SERIE*  
*W. H. W. & Son. Machinery*

1111

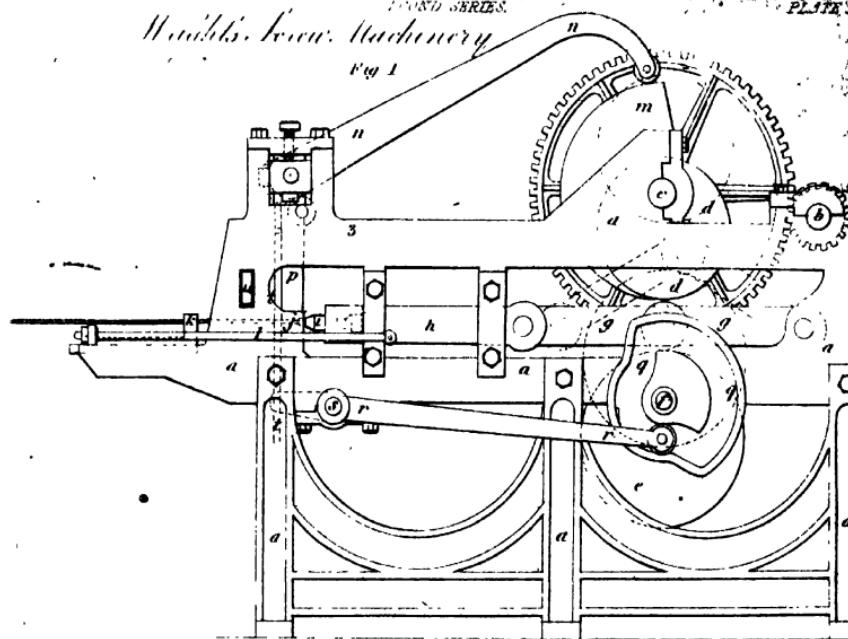


Fig. 2

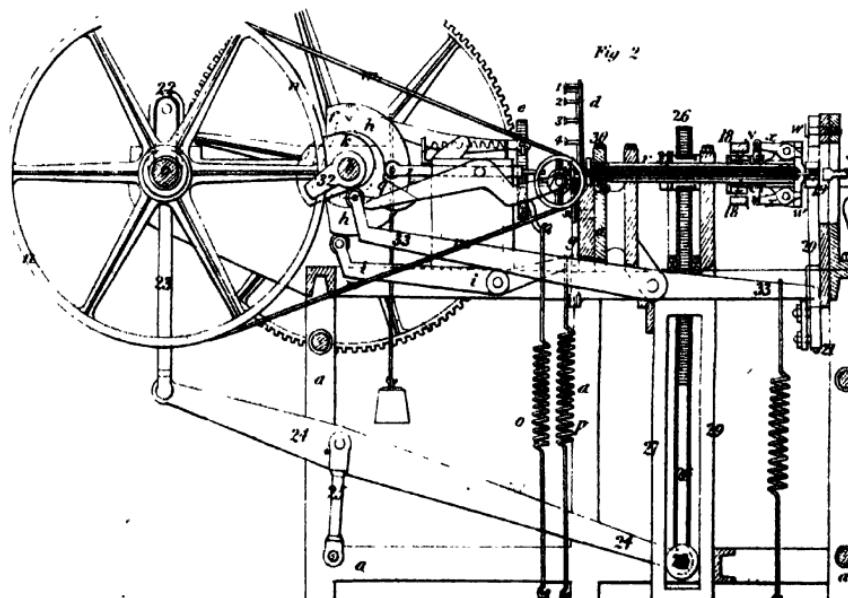


Fig. 15



Fig. 7.



11

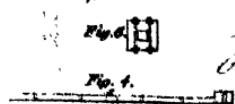
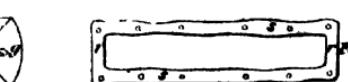


Fig. 1.



Greens. Imp. Masts.



THE  
**London**  
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No. XXX.

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[SECOND SERIES.]

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**Recent Patents.**

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*To LEMUEL WELLMAN WRIGHT, of Upper Kennington-lane, in the county of Surry, Engineer, for his having invented certain improvements in the combination and arrangement of machinery for making metal screws.—*  
[Sealed 17th March, 1827.]

IN the fourteenth vol. of our former Series, page 205, we noticed the ingenious machinery which forms the subject of this Patent, and intended to have given the details more at large in a subsequent report (with a Plate exhibiting the machinery.) We find, however, that the several figures of the drawings accompanying the specification are in many parts so extremely minute, as to render such reductions of them as would come within the compass of our volumes perfectly unintelligible, we can therefore only give such a general description of the whole as will point out the leading features of the invention.

The design of this machinery is to form screws of all sizes and kinds, but particularly those with open threads, usually known by the name of wood screws. The machines for making these screws are of two characters. The first is for drawing in certain lengths of iron or other metallic wire, which, by a peculiar construction of shears, is cut off into suitable lengths for the shafts of the intended screws; and each shaft being tightly held between dies, is compressed at the end by a powerful punch applied against it, which forces a portion of the metal into the die, and forms the perfect head of the intended screw. The second construction of machine is designed to receive the shafts at the time when the nicks or slits in the heads are to be cut in each of them; and in the same machine the thread or worm is produced round the shaft, by a turning process.

Referring to the report above mentioned, in Vol. XIV. embracing a more minute detail of the construction, we give this general outline of the invention, as a prelude to the following Patent, which is a further improvement upon the above machinery for making screws.—[*Entered in the Inrolment Office, Sept. 1827.*]

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*To LEMUEL WELLMAN WRIGHT, of Mansfield-street, Borough Road, in the county of Surry, Engineer, for his having invented certain improvements in machinery for making screws.—[Sealed 18th September, 1828.]*

THE invention specified under this Patent is, as we have above stated, for improvements upon the preceding, and consists of two separate machines, as in the first instance, varied from the former, not in principle, but in such of the minor details as experiment proved to be necessary, and

which ought to have been added to the former Patent as improvements essential to its perfection, without putting the Patentee to the enormous expense of new patents for the three kingdoms. This grievance we hope will be corrected under the proposed revision of our Patent Laws.

The first part of these improvements is described as a machine of nearly similar form and construction to the former for cutting off the required lengths of wire, and heading the shafts of the intended screws, but differing in its detail; the principal features of novelty being, 1st, the application of toggle joints acted upon by cams fixed upon rotatory shafts above and below, for the purpose of forcing forward the punch which compresses the end of the shaft into the die for forming the head; and bringing the punch back again; and at the same time feeding in the wire. 2d, the mode of moving the cutter for cutting off the required length of wire for each shaft; and, 3d, the novel arrangement of the general detail of the parts of the machine.

Fig. 1, Plate XII, is a side view of the machine, which will sufficiently exhibit the operations of the several parts; *a, a, a*, is the frame work of standards, upon which the working parts of the machine are mounted; *b*, is the first or driving shaft, on which a rigger is placed, connected by a band to any first mover, and communicates with the main shaft *c*, by a wheel and pinion. Upon this main shaft *c*, the main cam *d*, is fixed; *e*, is another shaft, driven by spur gear from the main shaft *c*, upon which the secondary cam *f*, is mounted, for raising the toggle joints *g, g*, after they have been depressed by the rotation of the main cam *d*, and have forced forward the punch bar *h*, and punch *i*, into the cup or die *j*, where the end of the wire shaft is compressed to form the head.

The wire is brought into the machine from the opposite

end by the feeding chaps or fingers *k*, which are connected to the punch bar *h*, by straps *l*; and as they slide backwards and forwards, the same movement is communicated to the feeding chaps which slide on their supports, and are so constructed as to close upon the wire in coming towards the machine, and in returning to open. The piece of wire shewn in the chaps is placed on a feeding board or table, and held by a pair of spring fingers.

Supposing the wire to be brought into the dies which have been previously opened, the cam *m*, on the main shaft as it revolves, forcing the longer end of the lever *n*, depresses its shorter end of the lever, and also the piece *p*, in which the upper half of the dies *j*, are mounted, and thus closes them, and the wire is by that means held firmly in the dies.

The rotation of the shaft *f*, being simultaneous with the main shaft, the double or grooved cam *q*, *q*, will raise the longer end of the lever *r*, which has its fulcrum at *s*, and depress the shorter end, and with it the cutter plate and cutter *t*, shewn by dots; and as the cutter passes the end of the die, it will separate that portion of the wire which is to form the shaft held in the die from the length of wire drawn in. The shaft is now ready to be compressed at the end of the punch, for the purpose of producing the head of the screw.

The cutter plate is formed of steel, and has a small hole through it, into which the end of the wire is forced; the other part of the plate being perfectly flat and smooth, forms a bearing for the end of the wire in the die.

The main cam *d*, having forced down the toggle joints, as shewn in the figure, the bar will be advanced, and with it the punch, which acting against the end of

the screw shaft, will press the wire into the cup of the die, and form the head.

The rotation of all the shafts and cams being continued, the cam *d*, will pass away from the friction roller in the toggle joints, and allow the secondary cam *e*, now to act upon the friction roller, and force up the toggle joints into the position shewn by dots, which movement will draw back the punch bar, and with it the feeding pincers, which now takes hold of another length of wire, and brings it into the machine, displacing the previously headed shaft.

During the time that the feeding chaps or fingers are closing upon the wire, the rotation of the double cam *q*, will have depressed the longer end of the lever, and forced up the cutter plate into its former position, that is with the hole opposite the end of the die, and the cam *m*, on the main shaft, allowing the end of the lever *n*, to drop upon its smaller diameter, it raises the piece *p*, in which the upper half of the dies are mounted. It is this movement that releases the shaft from the dies by opening them, and allows the next length of wire to be introduced by the feeding pincers, which bring another length of wire into the dies. As the punch recedes, a pair of spring clips or fingers are moved laterally across the machine fixed on the sliding bar *u*, which is put in motion by a lever and double cam on the end of the main shaft. The screw shaft is taken by these fingers to a stationary bearing in the middle of the machine, where it is held by a chap and lever, acted upon by a small cam on the secondary shaft *f*, until the next movement of the fingers fetch another screw shaft, when the fingers leave this screw shaft, and it is then taken hold of by another pair, and carried to a second heading die, where the heading of the screw is finished.

At the second heading die there is a similar arrangement of nearly all the parts, as in the first; the same

movements being required at the second operation upon the head, excepting the cutting off of the wire; and the opening and shutting of the die, which die is made in one piece.

The straps used in the first operation for bringing in the wire, are connected to a sliding rod in the same situation as the feeding apparatus, which forces out the screw shaft, after being operated upon by the second punch, when it is taken hold of by a third pair of spring fingers, and carried to another bearing, where it is held by another lever and chap, acted upon by a cam on the secondary shaft. The screw shaft is held in this situation for the purpose of bringing a turning apparatus to act upon the head, to remove any roughness or burr on the edge of the head, and to render the head truly concentric with the shaft.

This turning apparatus consists of a cutter mounted on a revolving shaft, placed within a tube, to which it is connected by a slot and key, so that they may revolve together; but the shaft has a sliding movement within the tube, the tube being kept by its bearings in its proper situation. Upon this tube is mounted a small rigger, which receives its motion by a band passing over guide pulleys to a large rigger or pulley on the first shaft. The end of the revolving shaft projects out of the tube, and is kept by a helical spring, coiled round it against the end of a sliding bar, acted upon by the cam on the secondary shaft; and on a screw shaft being placed upon the bearing, and held by the chaps and lever, the cams push forward the sliding bar, and with it the shaft, carrying the cutter up to the head of the screw shaft, and as it revolves, cuts away all roughness round the edge of the head.

After this is completed, the cam allows the sliding bar, and also the shaft and cutter to be drawn away from

the head, by the helical spring, when the cam on the secondary shaft, ceasing to act on the lever which holds the screw during the last operation, the now finished screw shaft is released and allowed to fall down below, it having been displaced by the third pair of fingers on their bringing another shaft to have a similar operation performed on it.

The second machine by which the notches in the heads of the screws are cut, and the thread or worming formed on the shaft, is also similar in its principles of action to the former machine, but differing considerably in the detail. The leading novelties are, 1st, that the cutter which forms the notch in the head, has a rising motion at the same time that it revolves, passing gradually up, and cutting its way to the proper depth through the head as it rises, instead of coming into contact with the head in a line with its centre as in the former machine. 2nd, in dispensing with the fingers, used in the former machine for carrying the screw shafts from one part of the machine to another, where the different operations of slitting the head and cutting the thread, when performed by the substitution of a tube, through which the screw shafts are pushed after having been notched in the head, and projected into a pair of revolving chaps, which hold the shaft while the thread or worming is made upon it. 3rd, the screw shaft, which has a reciprocating rotatory, as well as an advancing and retiring motion communicated to it during the operation

The reciprocating rotatory motion given to the shaft, is by a rack and pinion actuated by a crank and lever, and the advancing and retiring motion is effected by a leading screw, upon which depends the rake or obliquity of the thread of the screw made by this machine. 4th, the screwing dies are mounted on levers, on a vertical stationary

plate, and are made to close upon the shaft by the power of helical springs

Fig. 2, is a section taken through the centre of the machine last alluded to, which will sufficiently show the arrangements of the parts and their operations; *a, a, a*, is the frame and stand, and upon which all the working parts are mounted; *b*, is the main shaft, having the cams upon it which put the parts in operation; *c*, is the driving and crank shaft of the machine, to which the fly wheel, rigger and band are attached, and this is connected to the main shaft by a wheel and pinion shewn on the further side of the machine.

The screw shafts, previously perfected by the first described machine, are now brought to this, and by the boy attending it are severally placed in a novel kind of feeding wheel *d*, which has round its periphery a number of teeth like a ratchet wheel, and in each of these teeth, there is a notch or groove, into which the ends of the screw shafts are to be put, as at 1, 2, 3, 4, 5, where they are held by slight springs pressing upon them, as shewn in the figure. This feeding wheel is mounted upon a horizontal shaft, turning upon bearings, and has also upon it a ratchet wheel *e*, having twice as many teeth in its periphery as there are notches in the feeding wheel. The movement of this ratchet wheel is effected in the following manner:—

Upon the main shaft *b*, is fixed the cam *f*, which acts upon the friction roller, on the end of the weighted lever *g*; at the other end of this lever there is a spring tooth, which takes into the teeth of the ratchet wheel, and as the cam *f*, revolves, it raises the lever and depresses the spring tooth, and carries with it one tooth of the ratchet wheel; this movement takes place twice during one revolution of the main shaft and a succession of such move-

ments, will turn the feeding wheel at intervals, and bring the several screw shafts into the situation of 4, viz. into the mouth of a pair of holding pincers or chaps *g*, previously opened to receive them, and also opposite the mouth of the stationary tube before mentioned.

When the movement of the feeding wheel has brought the screw shaft into this situation, a cam *h*, on the main axle acts on the friction roller at the longer end of the lever *i*, and by depressing this end of the lever, raises the shorter end, and with it a pair of toggle joints connected thereto, at their central union joint; the ends of which toggle pieces are attached by joints to the extremities of the legs of the holding pincers, and on the lever rising and bringing the toggle pieces straight, the legs of the pincers become expanded, and the chaps made to take fast hold of the screw shaft, where they confine it, during the operation of forming the slit in the head.

The shaft being held in this position, the cutter *j*, is made to rise by the cam *k*, on the main shaft acting upon the longer end of the bent lever *l*; the cutter *j*, is mounted on a small axle, turning in, bearing in the forked or short end of the lever *l*, and rotatory motion is communicated to it by a band *m*, passing over a pulley on the same axle, and a large rigger or pulley *n*, on the crank shaft *c*.

It will be seen that as the cutter rises, it will pass through a part of the head, cutting its way and forming the slit; and as soon as this is performed, the cam *k*, ceases to act on the lever *l*, and allows the cutter to be pulled down into its former position by the helical spring *o*.

The operation of slitting the head being completed, the holding chaps are allowed to open a little by the smaller diameter of the cam *h*, coming in contact with the friction

roller on the end of the lever *i*, the other end of the lever with the toggle joints being pulled down by the spring *p*. At this time a cam *q*, upon the main shaft pushes forward a sliding bar *r*, with the punch *s*, against the head of the screw shaft, and forces it out through the chaps into the mouth of the tube *t*, *t*, in the position of the shaft 6, the holding chaps opening more widely as the head of the screw shaft advances towards them. On the screw reaching the position of 5, in the tube, it is held there by a pair of spring fingers.

These movements of the machine continuing as described, the shaft will be pushed forward at intervals, as additional shafts are introduced into the tube, until it reaches the position of the shaft 16.

Circumscribing the stationary tube *t*, *t*, is the revolving tube *v*, turning in bearings in the standards. On one end of this tube the sliding chaps *w*, *w*, are mounted, which hold the screw shaft while the worm or thread is cut upon its periphery. On the next movement of the machine, the screw shaft will be pushed out of the position 16, in the stationary tube to the position 17, in the mouth of the chaps *w*, which are then made to take fast hold of the screw shaft. This is effected by the depression of the shorter ends of the levers *x*, *x*, which are acted upon by the toggle joints *y*, *y*, brought into the position shewn in the figure by the movement of the clutch box *z*, *z*, to which these toggle pieces are jointed.

The movement of this clutch box *z*, is effected by another part of the machine not shewn in the figure, but will be understood by the following description:—On the ends of a forked lever 18, 18, are friction rollers, working in the groove of the clutch box; this lever lies horizontally across the machine, and the other end of the lever works on a pin as its fulcrum at the side of

one of the standards of the machine. To this lever is connected one end of a long sliding bar, extending the whole length of the machine, and bent in a semi-circular form under the main shaft, so as to allow of two small cams, which act upon two friction rollers on the side of the bar, to revolve freely without touching it. One of these friction rollers are placed in front of the main shaft, and the other at the back, and as the cams revolve, they alternately push forward the sliding bar, and with it the lever  $y, y$ , and clutch box  $z, z$ , into the position shewn in the figure, and close the chaps upon the screw shaft. The other friction roller is for drawing back the bar, lever, and clutch box, and opening the chaps  $w, w$ .

The screw shaft 17, being now firmly held in the chaps, we will proceed to describe the operation of cutting the worm or thread round the screw shaft. The dies or stocks 19, which cut or form the thread upon the shaft, are mounted in legs or levers 20, 20, which move on pins in the vertical plate or standard, and are made to close upon the screw shaft by the power of a helical spring 21, or springs connected to both of the legs, which draw them together, closing the screwing dies upon the shaft as they form the thread.

In order to form the thread or worm properly, it is necessary to give the shaft a reciprocating rotatory motion; this is done by the crank 22, on the shaft  $c$ , which is connected by the rod 23, to the lever 24, having its fulcrum in the rocking crutch 25, the longer end of which lever is connected by a joint to the vertical rack 26, and this rack takes into a pinion 27, on the revolving tube  $v$ . This pinion is connected to the tube by a key and slot, so as to allow the tube to have a backward and forward motion, while the pinion remains confined in its

proper place in gear with the rack, by a stationary bridle piece, embracing a groove in the pinion 27.

It will be seen that as the crank revolves, the rack will alternately be raised, and depressed, by the lever; and in order that the rack may be kept in gear with the pinion, there is a friction roller 28, on the joint of the lever and rack, which works in a parallel motion or guides 29, 29, the rocking crutch carrying the fulcrum of the lever, and accommodating itself to the motion of the crank and lever.

On the end of the rotatory tube the leading screw 30, is fixed, taking into a stationary female screw 31, fixed on one of the cross bearers of the machine. Upon this screw depends the backward and forward motion of the tube, and the rake or obliquity of the thread to be cut upon the screw shaft.

The operation of cutting the thread having been performed, a cam 32, on the main shaft, depressing the longer end of the lever 33, and causes the other end to be raised, and by means of a pair of toggle joints connected to this end by a centre sliding piece, to force apart the legs or levers, in which the screwing dies are mounted, and release the now forward screw from this pressure; at which moment the clutch box  $z$ , is moved back in the way before stated, and the screw released from the revolving sliding chaps  $w$ ,  $w$ .

At this time a pair of carrying fingers 34, fixed on the end of a sliding bar, are brought forward by the movement of a long bar extending from the main shaft; these fingers are brought in by a helical spring, and made to lay hold of the now finished screw; the continued movement of the main shaft causes a cam to act on this long bar, and move it the reverse way, and carry back the fingers, and in them the screw, which as it recedes

from the machine, meets with a projecting stud 35, by which the screw is forced out of the fingers, and falls away below into a basket, placed to receive them.

The cutting or screwing dies or stocks are to be well supplied with anti-attrition liquid from a vessel above, for the purpose of keeping the dies cool when cutting the thread on the shaft, and which greatly assists the performance of this part of the operation.

The Patentee considers that instead of the last described machine, it may be desirable, under some circumstances, to employ machines which perform the operation of cutting the thread or worming on the screw shaft only, and in that case proposes slitting the heads in a separate machine, by which he dispenses with in this machine the whole of the parts belonging to the slitting operation, excepting a pair of holding chaps at the end of the stationary tube, which are necessary to receive the shafts from the feeding wheel, and also serve as guides for the screw shaft, when forced into the tube by the punch.

The pair of holding chaps in this machine are two levers suspended on a vertical plate, from pins as their fulcrums, and have the holding chaps between them, which are brought together by a helical spring connected at its ends to the extremities of the levers. As the punch advances to push the screw shaft into the tube or wedge-formed piece on the under side of the punch bar, it forces apart the legs or levers, and opens the chaps, allowing the punch to push the shaft through them into the tube. In all other respects, this machine is the same as that last mentioned, but of course more simple in its construction.

The Patentee describes very minutely the detail of the fitting up of the several parts of the machine, and particularly the mode of mounting the screwing dies on their vertical plate; these dies may be mounted in their legs or

levers ; but he states in his specification that they are better fitted into sliding pieces, working in guides on the plate, and connected by pins to the legs of the levers, as being more steady than when fixed to the legs themselves, and that instead of the toggle joints on the end of the lever, the screwing dies may be opened by a wedge-formed piece on its end, forcing apart the legs and drawing open the dies.

[*Inrolled in the Roll's Chapel Office, March, 1829.*]

*To JOHN GEORGE, of Chancery Lane, in the county of Middlesex, Esq. Barrister at Law, for his having found out or discovered an invention for preserving decked ships or vessels, so as to render them less liable to dry rot ; and for preserving goods on board such ships and vessels from damage by heat.—[Sealed 18th December, 1827.]*

IT is considered by the Patentee, that the general cause of what is called dry rot in timber arises from the timbers being exposed to very different degrees of temperature acting upon different parts of their surfaces at the same time ; his object, therefore, is to effect a more perfect ventilation on ship board than the present construction of vessels will admit of.

It is assumed that the confined heat within the vessel makes its escape into the colder medium, partly by passing through the solid timbers and other wood work, and in so doing produces the approximate, if not the immediate cause of decay ; to prevent this the Patentee proposes to place a perpendicular, hollow shaft from the lower part of the hull up to the deck, through which cold air is to be passed, and collateral tubes are to be branched off from this main tube, extending to different parts of the

vessel, with orifices in them, furnished with valves for the discharge of the air; and sliders are to be made within the tubes in several places, for contracting the passages and regulating the quantity of air passed. Apertures are to be formed in different parts of the vessel, to receive the cold air, and tubes with valves made to extend therefrom, for the purpose of carrying off the hot air.

At the top of the shaft a moveable head is to be attached, with shutters capable of opening to admit the air, and that is to be done on the windward side of the vessel; but the quantity of wind admitted may be regulated by opening more or less of the shutters both on the windward and leeward sides.

The hot air is to be expelled from the different parts of the vessel by the superior pressure of the cold air passed down the perpendicular shaft; and the exit apertures are to be closed by very light valves, proposed to be made of writing paper.

These valves are to be constructed by cutting out several circular pieces of paper one smaller than the other, and attaching them together, for the purpose of giving stiffness, by a pin passed through the centre.

The mode of ventilation above proposed for the preservation of timbers from dry rot is also applied to cooling the hold of the vessel, in order to prevent the merchandize and other goods on board being injured by the confined and heated air. It is also proposed to place leather hose, with the lower open end in the part or recess of the hold, from whence any confined air or gas is to be drawn; and the reverse end of the hose is to be attached to a pump, or some other exhausting apparatus, in order to draw the air out.

It appears unnecessary to extend our explanation of this invention further, as the Patentee's intention must be

perfectly obvious. We regret, however, that we are unable to discover any originality of invention in this mode of ventilating, or ingenuity of contrivance in adapting it; but we are not prepared to say the same of the specification, for with such slender materials as those which constitute the subject of the patent, it is truly astonishing to see with what ingenuity, aided no doubt by study and deep legal knowledge, the Patentee has invented and brought on to fair parchment no less than *a hundred and ten Chancery folios* of written description, philosophical discussion, and legal comment bearing upon this subject, which constitute the matter of the elaborate specification now before us.—[*Inrolled in the Inrolment Office, June, 1828.*]

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*To CHARLES BROOK, of Meltham Mills, near Huddersfield, in the county of York, Cotton Spinner, for his having invented certain improvements in machinery for spinning cotton and other fibrous substances.—[Sealed 4th June, 1829.]*

THE object of this invention is to keep the loose fibres on the outside of cotton yarn, or other fibrous materials intended to be spun in a throstle frame, as close as possible, in order to render the yarn or thread when spun smooth on its outside. This is purposed to be effected by passing the yarn over a roller, which is partially immersed in a trough of water.

The new contrivance is shewn in connection with the working parts of an ordinary throstle frame, in Plate XIII, in which the same letters refer to similar parts of the machinery in the several figures, which are thus described by the Patentee.

“ Fig. 6, represents a front view of part of an ordinary spinning frame called a throstle, with my improve-

ment applied to it. In this view only part of the machine is shewn, the remainder being similar, and the part shewn sufficient to explain the action and nature of my invention. Fig. 7, is a transverse section of the same machine, and fig. 8, a plan of the part shewn in fig. 6.

“ In these figures *a*, represents fast and loose pulleys, which are driven by a strap in the ordinary manner; *b*, *c*, *d*, and *e*, are successive wheels for conveying the motion to the wheel *f*, which is placed on the front roller shaft, from which the other rollers receive the differential motion, for the purpose of drawing the roving.

“ In fig. 7, these wheels, *a*, *b*, *c*, *d*, and *f*, are shewn at their pitch lines only; and my reason for describing them here, or inserting them in the drawings, is to shew more clearly the exact position or part of the machine at which I apply my improvement.

“ Before I proceed to describe the way in which my improvement is effected, I shall state the object and nature of the improvement, which consists in producing a much smoother thread or yarn than is produced by the ordinary process. This I effect by passing each thread or yarn over a revolving cylinder during its passage or transit from the front or delivering roller to the flyer of the bobbin.

“ These revolving cylinders, over which the respective ends of thread or yarn are passed, are marked *g*, in the figures, and will be seen most clearly at fig. 8. The cylinders marked *g*, are supported on an horizontal shaft, which receives motion from the front roller shaft by means of the spur wheels *h*, and *i*, which gear into each other, and carry the shaft on which the cylinders *g*, are supported in an opposite direction to the revolution of the front roller, as shewn by the arrow in fig. 7.

“ Beneath the cylinder *g*, is placed a trough *k*, which

contains water, which the cylinders are partly immersed in, so that by their continuous revolution the upper part of their surface over which the thread or yarn passes in its passage or transit from the front roller to the flyer of the bobbin is kept constantly wet, the consequence of which is that the motion of the yarn or thread from the front or delivering roller to the bobbin being opposite to the direction of revolution of the cylinders marked *g*, loose fibres, which otherwise would stand off, are incorporated into the thread or yarn, and the twisting proceeding at the same time unites them into its substance, instead of allowing them to stand off.

“ On referring to fig. 7, it will be seen that the cylinder *g*, over which the thread or yarn passes in its passage from the front or delivering roller to the flyer of the bobbin, presses the thread or yarn a little out of the straight line, which is required to produce the effect of incorporating the loose fibres into the thread or yarn as already described.

“ This pressure is regulated by set screws seen at *m*, which, being connected with the steps or supports in which the shaft carrying the cylinders *g*, revolve, enables the operator to adjust the position of the cylinders as required.

“ At the back of the cylinders *g*, and immediately beneath the front roller is placed a revolving shaft *l*, which also receives motion from the front roller by means of spur wheels. This shaft *l*, extends the whole length of the drawing rollers, and is covered with woollen cloth, for the purpose of taking up any ends of yarn which may break. Thus, supposing any one of the ends of yarn or thread to break between the front roller and the bobbin, the roving which would continue to be delivered from the front roller would necessarily fall on the covered shaft *l*,

and adhering to the woollen surface, be wound or taken up by its revolution, and thereby be prevented from interfering with any other part of the machine.

“ This shaft *l*, and its property of taking up any broken ends that may occur, I name as a useful application, but do not in any way claim it as part of my invention.

“ Having described my improvement in machinery for spinning cotton and other fibrous substances, I declare that I do not claim any of the well-known portions or parts of the machine hereinbefore described, such parts having been named to make the description and nature of my invention more clear; but I do claim that arrangement of parts described at the letters *g*, *h*, *i*, *k*, and *m*, which consists of a revolving cylinder or cylinders introduced between the front or delivering rollers, and the cop or bobbin of a spinning machine, for the purpose of pressing against the thread or yarn, which, in conjunction with the water received on to its surface from the trough *k*, below, produces the effect already described.

“ And I further declare, that my improvements may be modified and varied by driving the cylinders *g*, in an opposite direction, or from other parts of the machine than that from which I have driven them, as well as by the application of bands and pulleys instead of wheels, for the purpose of revolving the cylinders, all which well-known modifications and variations, together with the proportions of the different parts, as well as the material to be used in constructing those parts, may be attained with facility by any person of competent skill, and fit to be intrusted with the direction and construction of machinery of this and a like description.—[*Enrolled in the Inrolment Office, December, 1829.*]

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*To LAMBERT DEXTER, of King's Arms Yard, Coleman-street, in the city of London, Esq. in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of certain improvements in machinery for the purpose of spinning wool, cotton and other fibrous substances.—[Sealed 16th June, 1827.]*

THESE improvements consist in the adaptation of a peculiar construction of flyers to a spinning machine, by which the threads or yarns are wound upon the bobbins; and also in the introduction of rollers, which pinch the threads and hold them while they are twisted and wound.

The specification does not explain the invention in very clear terms; but we have endeavoured to supply the defects from our own knowledge of the invention, occasionally introducing the Patentee's own words, which are merely descriptions of the several figures, as represented in Plate XIII.

Figures 1, 2, and 5, are vertical elevations, shewing the improvements adapted to the spinning frame. Fig. 3, is a vertical section of the improved part detached; and fig. 4, is a horizontal representation of the upper part of fig. 3; both of these last-mentioned figures being drawn upon a scale three times the size of the former: the similar letters of reference pointing out the same parts of the machinery in all the figures.

In fig. 1, *A*, is the driving rigger of the machine, to which the moving power is applied by an endless strap; and *B*, is the loose rigger on the same axis, to carry the endless strap when the machinery is required to be at rest.

*C*, is a toothed wheel, fixed on the horizontal axle of *A*, to drive the toothed wheel *D*, which is fixed at the end of

another horizontal axle, extending across the machine, having a bevil wheel *E*, and a worm *a*, at its other end. The wheel *E*, drives a similar bevil wheel, fixed at the lower end of an oblique axle *F*, which has another bevil wheel at its upper end, intended to drive the wheel *G*, fixed at the end of the axle of the metal rollers *H*.

Bearing upon the rollers *H*, are the other metal rollers *I*, covered with leather, which turn in open bearings, and are pressed down by the springs *K*, screwed on the top of the cast iron frame *L*. The supports of the rollers *H*, & *I*, are fixed to the top of the frame *L*, by the screws *M*.

*N*, and *O*, are two horizontal cast iron rails, reaching from one end of the machine to the other. The ends of these rails are fixed by screws to the end frames *L*, and to them are attached the upper and lower carriages *P*. & *Q*.

The worm *a*, at the extremity of the axis of the bevil wheel *E*, drives the worm wheel fixed to the upper end of the oblique axle *R*, which axle having a bevil wheel at its lower end, drives the wheel *S*, on the horizontal axle *T*.

On the axle *T*, the heart-shaped cams or excentrics *U*, are fixed, which act against the extremities of the levers *V*, turning upon fulcrums *W*, at each end of the machine. The other extremities of these levers *V*, raise the horizontal sliding rail *X*, which is guided in its ascent and descent by rods *Y*, moving in guides fixed at each end of the machine to the frames *L*. This movement of the rail *X*, is for the purpose of raising and lowering the spindles *b*, which slide through the pulleys *e*, and carry the bobbins *c*.

An endless line *d*, passes round a pulley fixed on the axle of *c*, for the purpose of driving the pulley *e*, and with it the twisting flyer *f*, *f*, which are connected together by a small pin; both *e*, and *f*, turn round on a vertical cannon or pipe fixed in the arm *Q*. Another endless line *i*, passes round a pulley fixed in the axle of *D*, for

the purpose of driving the pulley *k*, and the drawing flyer *m*, which are made to revolve together by means of a connecting pin; these turn on pipes or cannons at the extremities of *P*.

Connected to each of the drawing flyers *m*, there are two horizontal metal rollers *n*, and *o*, the former of which is covered with leather, the latter plain or fluted; their bearings are in the frame *m*, and their contact is adjusted by a spring *q*.

A worm wheel *p*, is fixed on the axle of *o*, and as this wheel is carried round by the revolution of the flyer, its teeth take into the inner edge of a concave worm, or spirally twisted ring *r*, held by a stem *s*, which stem is screwed into the frame of the machine.

The obliquities of the spiral edge or concave worm within which the frame *m*, with its rollers revolves, must be adapted to the number of teeth in the worm wheel *p*; and for the purpose of varying the obliquity of the concave worm, the block *t*, may be made of any required thickness, and the edges brought closer together by a screw.

The wheel *p*, escapes one tooth at every revolution of the drawing flyer *m*, by which means the rollers *m*, and *o*, are made to revolve, and the fibrous substance is drawn forward and held between the two rollers, while it is twisted by the rotation of the flyer *m*.

The Patentee says, "this is a new and most important part of the machinery. The fibrous substance to be spun, wool for instance, is first to be passed between the feeding or drawing rollers *h*, *i*, then between the rollers *n*, *o*, in the drawing flyer *m*, and afterwards through the top of the twisting flyer *f*, through the loops *h*, *k*, fixed to *f*, and lastly is to be attached to the bobbin *c*; the wheel *d*, being twice the diameter of the wheel *c*, causes the drawing flyer *m*, to revolve with less than half the velocity of

the twisting flyer *f*, which is necessary, in order to give sufficient twist to the thread or yarn *w*.

“ These rotative velocities of the flyers will require varying for different fibrous substances, and according to the views and intentions of the manufacturer. The action of the heart-shaped excentric *u*, on one end of the lever *v*, causes the bobbin *c*, to rise and fall in such a way as to wind up the thread or yarn upon it in a regular and advantageous manner.

“ The spindle *b*, does not revolve, being fitted tight into a round hole in the brass step on the moveable rail *x*; the thread or yarn is wound upon the bobbin *c*, sufficiently tight, in consequence of the friction between the bottom of the bobbin and the brass collar which is fixed on the spindle.

“ Fig. 5, represents another method of moving the rail *x*, and the spindles *b*, for the purpose of winding cops or bobbins ready for use in weavers' shuttles; *x*, is a spiral cam wheel with its teeth downward fixed on a vertical axle 2, on which is also fixed the worm wheel *y*, driven by the worm *z*, which said worm may be placed on the middle of the length of the horizontal axle of the wheel, instead of using the heart-shaped excentric *u*; 3, is a lever of which there are two alike, one near each end of the machine connected together by a horizontal rail, which has in the middle of its length a tongue 5, bearing always against the teeth of the wheel *x*; the fulcrum of the two levers is at 4; a line 6, passes over a fixed pulley 7, and has one end fastened to the long arm of the lever 3, and the other end fastened to the rail *x*.

“ The rise of the teeth of the wheel *x*, and the relative lengths of the arms of the said levers are so proportioned as to raise the bobbin 9, just the height required. The weight 10, suspended from each lever is a counterpoise to

the rail x, and its cord, and is to be sufficiently heavy to make the tongue 5, always bear against the wheel x.

“ To use this patent machinery in combination with any other machines now employed in preparing fibrous substances for spinning, all that is necessary is to bring the said substance from such preparing machine to a pair of horizontal rollers similar to H, I, placed at any convenient distance above the drawing flyer m.

“ I do not claim as new in this kingdom, any parts of the machinery herein specified, taken separately, but I claim the specified machinery as a whole, as a new and valuable combination not hitherto known, and used in this kingdom for the specified purpose.”

[*Inrolled in the Inrolment Office, December, 1827.*]

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*To JOHN MARSHALL, of Southampton-street, Strand, in the county of Middlesex, Tea-dealer, for his new invented method of preparing or making an extract from cocoa, which he demominates Marshall's Extract of Cocoa.—[Sealed 10th December, 1829.]*

THIS is a mode of preparing cocoa differing from that commonly practised, but how far the product is better than the usually prepared cocoa (called Patent), of the shops, we are unable to state, as the present Patentee has not set out in his specification the particular advantages of his improvement, nor in the particular features of novelty which he proposes to claim.

The method of preparing, and the proportions of the materials are these:—Take about one pound of cocoa, either the Caraccas or Trinidad Nut is to be preferred, and having ground it, mix it with about a gallon of pure water. Let them boil together for the space of about one hour, and after skimming off the oil and scum very

completely, pass it through a strainer of fine wires or horse hair, to prevent any lumps or extraneous matters from remaining in it.

This liquor, which is a strong decoction of cocoa, is now to be placed in an open dish or shallow vessel, immersed in a steam or hot water bath, not over a rapid fire, for the purpose of causing the watery parts to evaporate rapidly, without exposing the cocoa to the risk of burning to the vessel; during this part of the process the extract is to be kept in continual agitation, which will prevent it from coagulating, and when the heat has evaporated the liquor to the consistency of treacle, it may be considered to be sufficiently reduced, and after being allowed to cool, may be secured in bottles, and sealed up from the air, and will keep good and ready for use for any length of time.—[*Inrolled in the Inrolment Office. February, 1830.*]

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*To RICHARD GREEN, of Blackwall, in the county of Middlesex, Ship-builder, for his having invented certain improvements in the construction of main-masts.*  
—[Sealed 5th February, 1829.]

THIS invention applies to the construction of that description of masts for ships, which are composed of several pieces of timber combined together, called *made masts*, in distinction from solid masts, and the peculiar method of putting these pieces together, constitutes the subject of the patent which is described as follows:—

Plate XII. Fig. 3, represents my invention as applied to joining the butts of two pieces, *a*, *b*, of square baulk timber, such as is used in forming the larger sized made-masts; *e*, is a square tenon, formed on the piece *b*, of the length of six or eight inches and four inches square, and fitting into a corresponding mortice cut in the end of

the piece *a*; *rr, ss*, is a wrought iron brace let into the piece *a, b*, so as to be flush with their surfaces; there is a corresponding wrought iron brace at the opposite side of the pieces *a, b*, and the two braces are bolted through the timber to each other.

It will be observed, that the brace is wider at the two ends *rr*, than it is in the middle, thus forming a double dovetail; the ends *rr*, are also thicker than the rest of the brace, forming the shoulder on the under side, and consequently let deeper into the wood.

Fig. 4, is a side elevation of the said brace, drawn to a larger scale, in order to shew more clearly the increased thickness of the ends *rr*; fig. 5, is a plan of the said brace; and it will be observed, that the width of the metal is increased at every bolt hole, and at the joining of the butts. Fig. 6, is a transverse section of fig. 3.

The butts of the pieces of square timber are thus secured, first taking care to pay their ends with coal tar, or any such mixture, and introducing a piece of canvas between the two, well soaked in the same composition.

The core or spindle of this mast is to be made of one or four square pieces, according to the diameter of the mast, and the several pieces to be connected round it with dowels or coakes being introduced between all the surfaces four feet apart, three inches in diameter, and go one inch and a half into each piece. A bolt of one inch in diameter is to be driven through all the pieces at every other dowel in each surface, thus preventing the dowels from canting and the mast from twisting in the bracing up of the yards. The mast is then rounded and tapered from the heel and head, and hoops are drifted on, taking care that each butt shall be covered with a hoop. Where drift hoop cannot be used, clasp or wedge hoops should be substituted.

It will be understood that no two butts or joints must

lie in the same transverse section, they must be so shifted as to have a hoop between each.

Fig. 7, is a transverse section of a mast composed of four three-sided pieces of timber ; the section is supposed to be just at the butt of the piece ; *d*, represents the square mortice to receive a square tennon before mentioned.

It will be evident that when the pieces of timber of this shape are used to form the mast, the two braces, which must\* in this case be placed as shewn in fig. 7, cannot be bolted through to each other, and wood or coach screws (as they are termed) therefore, only must be used to hold them in their places, as shewn by the dotted lines.

Fig. 8, is a perspective view of the piece *d*, united after the manner of my invention to the piece *f*. The upper end of the piece *d*, is prepared to receive other similar braces, and *g*, is a square tennon as before alluded to. It will be seen by this figure that the three-sided pieces are connected together by dowels or coakes, three feet apart, three inches in diameter, and go one inch and a half into each piece, and may be bolted together if necessary, and hooped with drift or clasp hoops as in the larger masts, taking care to cover the butts with a hoop as before stated, which butts should be about ten feet apart, thus having three hoops between each.—[*Inrolled in the Inrolment Office, April, 1829.*]

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## COCHRANE AND GALLOWAY v. BRAITHWAITE AND ERICSSON.

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AN alleged infringement by Messrs. Braithwaite and Ericsson of the Patent right of Messrs. Cochrane and Galloway having been the subject of some recent discussion

in the Court of Chancery, and which invention being, as we hear, about to be brought before the Judges, we have considered a report of the principles of the invention would be acceptable to our readers; the date of the Patent (1818) being antecedent to the commencement of our Journal, and the specification therefore not previously noticed by us. The invention of Messrs. Braithwaite and Ericsson, which constitutes the subject of the alleged infringement, will be found in Vol. IV. of our Second Series, page 188. The following is an extract from the specification of the Patent granted to

*To Sir THOMAS COCHRANE, Knt. and ALEXANDER GALLOWAY, Engineer, for the working or making a manufacture, being a machine or machines for removing the inconvenience of smoke or gases generated in stoves, furnaces or fire places, by the ignition or combustion of coals, or other inflammable substances, and in certain cases for directing the heat and applying such smoke or gases to various useful purposes, which will be of great public utility.—[Sealed 4th May, 1818.]*

“ OUR said invention consists of making and forming a machine or machines for the heating of boilers, and may be denominated improved air-tight stoves, furnaces, or fire-places, into which coals or other combustible and inflammable substances shall be used to generate and convey heat, by the ignition and combustion of coal or other fit substances; and which air-tight stoves, furnaces, or fire-places must be composed and formed of any suitable materials, and with means which will permit the entrance and prevent the escape of any atmospheric air or gas into or from such stove, furnace, or fire-place, but at the situation or situations formed for the introduction and exit of

such air or gas; by means of pumps, valves, or other suitable machinery, which shall be capable of supplying any such stoves, furnaces, or fire-places, with any required quantity of atmospheric air, to keep up the ignition of any fuel or combustible substance; and at the same time to force out of any such stove, furnace, or fire-place, any smoke or gas so generated against any required resistance or pressure.

“ Our invention is of a three-fold character—the first part of it is for removing the inconvenience of smoke or gases generated in stoves, furnaces, or fire-places, by the ignition or combustion of coals or other inflammable substances; the second part is in certain cases for directing the heat so generated; and the third part is for applying such smoke or gas to various useful purposes hereafter to be explained.

“ These said branches or parts of our invention may be applied collectively, or so much of them as may be required, under a great variety of modifications, which will be familiar to any competent workman constructing such works.

“ In Plate XII, figs. 9, and 10, are views of machines for forming air-tight stoves, furnaces, or fire-places, for heating boilers for generating steam, with the apparatus for blowing in compressed air into the fire-place, and for condensing and dissipating, and thereby removing, the inconvenience and annoyance of smoke and gases generated in any air-tight stove, furnace, or fire-place, but without applying such smoke or gas to any useful object, and which are applicable to any land situation, but of such dimensions and modifications as may best suit the particular convenience of the employment and place to which they are to be applied.

“ *AAAAA*, show an air-tight, horizontal, and vertical

stove, furnace or fire-place, with its flues to heat a boiler for generating steam, or for such other purposes to which it may be found convenient to apply the action of heat. *B*, is the pipe through which a supply of atmospheric air is conveyed by means of a pump or pumps, or other instrument for forcing air into the fire-place to keep up the combustion of any fuel previously ignited. In the pipe *B*, is contained a metal valve, which shuts against its seat by the pressure of the smoke from the fire, and opens by the force of the atmospheric air conveyed from the pump or other proper instrument employed to blow in the air.

“ The pipe *B*, may either discharge its supplies of air by being introduced under or upon the ignited fuel of the horizontal fire, or be conveyed into any convenient part of the vertical fire-place ; or if more than one pump is employed for this purpose, then the air may be blown into both fires at once, as circumstances may point out. *C*, is the plate or valve by which the smoke, gas, and heated air are compressed, according to the pressure placed on such plate or valve either by any weight or fluid, or by any other known means of producing any required resistance. The opening or rising from its seat of the valve or plate *c*, allows the escape of the smoke, gas, and heated air, when the inflammable parts of the smoke shall have been subjected to any required degree of exhaustion, according to the resistance made to their escape.

“ The reservoir or vessel *D*, receives and encloses the end of the pipe which forms the seat of the valve *c*, and is made to contain the required quantity of water that shall be sufficient to perform the double object of confining the smoke until it is deprived by the action of the fire of any required quantity of its combustible pro-

*PERTIES ; and in its exit and passage through the water it is cleansed of some of its mucilaginous properties, and in such a purified state it may either be collected for any useful object, or it may be allowed to escape into the atmosphere without creating the inconvenience and annoyance generally experienced from the exit of foul smoke from any ordinary chimney, particularly from those chimneys employed for the use of steam engines.* E, is the iron door to shut off the fire, and the ash pit G. F, is the metal chamber which encloses the fire-doors E, and the ash pit G, and which must be made perfectly air-tight when its cover I, is shut into its mouth H.

This mouth, or curved orifice, in the chamber F, furnishes, when it is open, an introduction to the doors of the fire and ash-pit. The spherical cover I, must be fitted and ground correctly air-tight into the mouth of the chamber F, and which is kept in that state by the pressure of the screw J, and by which means the atmospheric air is prevented entering into the fire or the ash pit, through the door E. The smoke, gas, or heated air, are equally secured from escaping through the doors of the fire and ash pit.

K, is the iron bridge which swings on its pivots, and which is connected to the chamber F, and into which the screw J, works by its lever, L, and by a few turns of which screw the cover I, is permitted to move out of the way of the orifice or mouth of the chamber, and thereby gives a free entrance into it when required.

“ M, M, are metal tubes of sufficient length to prevent the action of the fire from injuring the strong glass or glasses that is to be fixed in them for viewing the fire, and of such a diameter as will afford a general survey of the fire ; these tubes, with their glasses, must be made air.

tight, and fixed securely in the spherical cover, *i*, opposite the apertures made in the fire-doors to view the fire.

" *N*, is an iron rake, with a shifting handle, and a roller or feet placed at the bottom to prevent the teeth of the rake from falling entirely out of the fire bars, although it is desirable that they should be as low as possible; and it is necessary, when this rake is not in use, that it should be kept in the recess made for it in the ash-pit at *d*, and which is introduced into the ash pit for distributing the fire; and for clearing the bars on which the fire is placed; which rake moves in a ball and socket stuffing box, *o*, inserted in the cover *i*. By this means the fire is raked without opening the cover, and without sustaining any loss of the compressed air with which the fire and ash-pit is supplied.

" *P*, is a metallic magazine placed at the top of the vertical fire, and surrounded with a case or reservoir for holding of water to keep the reservoir from becoming too warm, and from which the boiler may be supplied with warm water as fast as the reservoir is fed with cold water, and which magazine *P*, may be made to contain any required supply of unignited fuel, and which magazine must be made air-tight in all its parts.

" *Q*, is the frame or mouth of the magazine through which the fuel is to be conveyed into the interior of it. *R*, is the air-tight cover or plate, which by the pressure of the screw *s*, working through the swinging bridge *T*, forces down the cover *R*.

" Near the bottom of the magazine *P*, is placed a valve or door *V*, with an axle through or across its centre after the manner of a throttle-valve of a steam-engine as respects the axle of the valve or door; one-half of which valve or door will rest, when closed, on the lower part of

the seat *ww*, while the other half of the valve or door rests on the upper part of the seat.

“ The form of the valve-seat as shown at *ww*, will be found to be very convenient, as by its angular shape no coals or other fuel will lay upon it to obstruct the shutting of the valve or door *v*, which is performed by the motion of a handle.

“ The object of this valve or door is not only to shut off the unignited fuel from the vertical fire, but to allow the magazine, *P*, to be replenished with fuel as often as required without permitting any considerable escape of smoke, gas, or heated air; and when the cover *R*, is closed or shut, then the valve *v*, may be opened whenever the fire shall require any additional supply of fuel; and when it is so opened, the cover *R*, must completely prevent the escape of any smoke, gas, or heated air, through the magazine *P*.

“ *Y*, is a chimney of any required height, issuing from the top of the boiler, and in connexion with the flue with its cover *z*; its screw *e*, the bridge *f*, in which the screw works, and the lever *g*, by which it is moved. This chimney may be used for carrying off the smoke when the fire is first lighted, and when the valve or cover *l*, is opened to admit freely and copiously the atmospheric air under the fire.

“ When the stove, furnace, or fire-place of the boiler is so used then it is a fire on the common principle, and when used in that state it forms no part of our invention; but when the covers and valves *l*, and *z*, with either the cover *R*, or the valve *v*, are shut by any sufficient machinery, and rendered air-tight in those parts, and a full supply of atmospheric air forced into the fire at the place or places assigned for its entrance, then such a change

and combination in the machinery puts this part of the principle of our invention in full force.

"A fire-place and its apparatus, thus arranged, will produce not only a saving of fuel, by extracting a greater quantity of combustible material from the fuel, but will direct the heat to the object of its application more effectually than hitherto done, and will at the same time, remove the inconvenience and annoyance sustained from the issue of large quantities of foul smoke as at present experienced from ordinary fires and chimneys employed for the heating of boilers.

Figure 10, shews a view of a boiler, flues, &c. similar to the boiler, flues, &c. shown in figure 9, but fitted to a ship or vessel, and from which the smoke, gas, and heated air are permitted to escape for dissipation through the side of such ship or vessel into the water, at such a depth from the surface as may be necessary. The smoke-pipe or horizontal chimney B, leading from the boiler A, contains the valve c, which opens by the pressure of the smoke, and is shut by that of the water. The pipe or chimney B, is surrounded, and the valve c, guarded by the metal case or pipe DD, which connects to the boiler, and is made water-tight and of such dimensions as shall contain a sufficient quantity of water to keep the case or pipe DD, so cool as not to injure the timber of the vessel with which it comes immediately in contact. *The pressure on the valve c, is regulated by its area, and the height of the external column of water bearing on the valve, and according to which pressure must be the force of the compressed atmospheric air, necessary to feed the fire in which the smoke is generated.*

Another feature of novelty proposed in the latter part of the specifications is to conduct the heated air or gas

from the flue into the box of the paddle wheel, for the purpose of assisting in propelling the vessel, but we consider there are some practised objections to the employments of this contrivance, and as it does not bear upon the parts said to be infringed, we have omitted it.

The abstract parts, or the combinations of machinery, by which we construct our air-tight stoves, furnaces, or fire places, we do not claim, but as they are necessary as means, to effect the object of our invention : these objects may also be effected and produced by other abstract parts and combinations of machinery, not explained or described either in this specification, or in the drawings annexed ; but yet such alterations may be made embracing the principles of our invention that may be a different modification of them, and yet be substantially in their effects and principles our invention ; which is for the working or making a manufacture, being a machine or machines for removing the inconvenience of smoke or gases generated in stoves, furnaces, or fire-places, by the ignition or combustion of coals or other inflammable substances ; and in certain cases for directing the heat, and applying such smoke or gases to various useful purposes.—*Enrolled, Nov. 1818.*

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*To JOHN VATES of Hyde, in the county of Chester, calico-printer, for his invention of a method or process of giving a metallic surface to cotton, silk, linen, and other fabrics.—[Sealed 26th January, 1830.]*

THIS invention is a method or process by which a very beautiful metallic surface can be given to cotton, silk, linen, or other fabrics, to be used in printed furniture, hangings for the walls of rooms, and various other pur-

poses. The effect produced by the different coloured printed figures on the metallic surface is very beautiful. The following description will explain this method of effecting the same :—

#### SPECIFICATION.

“ My said invention consists in applying a metallic surface to cotton, linen, silk, and other fabrics, by reducing the metal or metals employed to a state of powder, afterwards mixing that powder with some farinaceous paste or other mucilaginous or cohesive substance, such as glue or gum, to cause it to adhere to the cloth or fabric to which it is to be applied, and by subjecting the cloth to which the powder has been applied to a high degree of friction, in order to produce the bright or burnished appearance of metal at much less expense than has been hitherto effected. And in further compliance with the said proviso, I, the said John Yates, do hereby declare, that the manner in which my said invention is to be performed is set forth in the following description, that is to say, the metal I commonly use is tin, as combining cheapness with brilliancy, and I dissolve it by means of a sand bath, in pure muriatic acid, of the specific gravity of 1.160, or thereabouts, until the quantity of acid used is saturated with the tin, which is always known when any portion of the latter continues in the vessel undissolved by the acid. This solution so prepared and ready for use, I keep carefully made up in bottles to prevent its absorbing oxygen ; I then employ a vessel of wood, about five feet long, three feet wide, and one foot deep, along which I place lengthwise an iron centre, which runs on its own axis, and having supporters on which centre I frame a cylinder of hoops of zinc or spelter, running the whole length of the vessel, each hoop being fourteen to twenty inches in diameter, about five or six inches wide, and one

or two thick ; the cylinder is so placed as to run about half an inch deep in the liquor used, I then fill the vessel with pure cold water, and the solution of tin before mentioned, in the proportion of one part of the solution to ten parts of water, and the cylinder is made to revolve slowly by the application of any moving power, so as continually to present a fresh surface to the liquor in the vessel. This process is continued, the tin appearing reformed or revived on the whole surface of the cylinder, by the combination of the zinc of the cylinder with the oxygen of the tin previously dissolved in the liquor, and consequent precipitation or revival of the tin, according to a principle well known and acted upon in chemical manufactories. The tin so reformed or revived is carefully scraped off by a wooden or metallic instrument into another vessel in which it is washed with clear water, in order to deprive it of every impurity, the water being changed or renewed until it becomes tasteless.

“ The metal after being subjected to this washing is taken out and ground between two flat pieces of wood until it will pass through a fine brass wire sieve ; it is then boiled several hours in water, and is afterwards put upon flakes or filters of cloth in a stove to dry ; when dry it is again passed through a fine brass sieve, and again boiled in water for about four hours ; after it has undergone the second boiling I add to the water in which the metal continued after the second boiling a little diluted muriatic acid in order to take away any oxidation of the metal, which might have occurred during the operations above described, or any remaining impurity. It is then again washed in cold water, until the water becomes tasteless, and being then taken out, dried as before, and again passed through a fine brass wire sieve, it is fit for use in the next stage of my process.

“ In order to apply the powder to cover the whole surface on one side of any fabric of cloth composed of cotton, linen, or silk, either separately or combined, I proceed as follows; my cloth being scoured, cleaned, bleached, or dyed as may be required, I pass it through a friction or common calender to give the fabric a firm, and smooth face. I then by means of a machine or block or brush, any of which may be used for this purpose, lay on a uniform covering of starch or paste of sufficient consistency to work easily; the starch which I use for the purpose, being made by dissolving about one pound and a half of starch in one gallon of water; a covering or coat of the dry metallic powder is then carefully laid on the surface with a soft brush, and the cloth is afterwards dried. In some cases, I prefer drying the piece after the starch or paste has been laid on, and afterwards wetting it again with cold water, by a brush on the face, or I immerse the piece upon which the starch or paste has been laid and dried in water, and after the immersion I pass it through padding rollers, so as to leave it uniformly wet. I then apply the metallic powder in the manner before mentioned: when perfectly dry the piece must be well brushed with a hard brush, to take off all the powder which does not firmly adhere. I then pass the cloth through a friction calender of the ordinary description employed in glazing calicoes, or I pass it over second hand cards as hereinafter described, or I glaze it by hand.

“ The pieces when thus finished may have figures embossed upon them, or may be printed with colours, or varnish may be employed to give various hues to the metallic face, or a watered effect may be given to the fabric. To produce the latter effect, I pass it again through the calender, which for that purpose must have a fine cotton or linen cloth wrapped round one of the cy-

linders before the operation. In order to cover part only of any piece of cloth or other fabric with a metallic surface, I pass the piece through a common or friction calender, in order to make the face firm and smooth to the touch, I then apply starch or paste, by means of a machine, or block, or brush over those parts of the fabric on which the figure is required. I then carefully apply the metallic powder with a soft brush, whilst the impression is wet as before described until the piece is finished. The cloth is afterwards dried and brushed well with a hard brush, in order to remove all the superfluous powder that may attach to the piece. After this operation the piece must be passed through a slightly heated friction calender, or may be glazed by hand so as to cause the raising or burnishing of the metallic surface required.

“ In order to produce the effect of matted or dead silver, I make use of old steel cards (which have been previously used for carding cotton) which I so fix upon a board, or in a frame, or in a roller, as that the piece of cloth or other fabric may be drawn against them the smooth way of the card until the metallic surface assumes a dead or matted appearance.

“ In order to apply my invention to yarns or thread in the skein or hank, or in the warp, the same process must be gone through as is hereinbefore described with respect to piece goods, taking care to use starch thinner in point of consistency. The starch which I use for this purpose is made by dissolving about one pound of starch to one gallon of water; care must also be taken that the threads be kept sufficiently separate and distinct, so as to admit of the metallic powder reaching and covering every part of the thread. The dressing machine commonly used by power loom weavers answers very well for that purpose.

“ In applying my invention to paper, I use the same process as is done in piece goods, except that when I again wet the starch or paste which has been suffered to dry on the paper, I do it in all cases by applying water by means of a brush as before described, and not by immersion in water. The starch used being of the consistency produced by dissolving about one pound and a half of starch in one gallon of water. In applying my invention to leather the process is the same as is hereinbefore described with respect to piece goods, except that I commonly use glue as the adhesive substance for fixing the powder firmly upon the leather, dissolving about four pounds of glue in one gallon of water, and the glue being used when quite hot, the powder being applied either immediately after the glue is put on or after the glue has dried, and being again wetted in the manner before mentioned, in describing the process of applying the powder by means of starch to fabrics of cotton, linen, or silk. The friction necessary to give the bright or burnished appearance may be applied by hand according to the nature of work required to be done. To produce the appearance of matted or dead silver, second hand cards may be employed as before described. Leather, which has been curried and polished as for sale, is the best for the purposes aforesaid.

“ Although I have in the previous description stated the size of the vessel and the description and strength of acid I use, and also that I prefer starch as the adhesive substance for attaching the powder to cotton, linen, or silk, either separately or mixed, or in yarns, or in the piece, or to paper. I declare that the vessels in which the metals are revived or reformed may be adapted in point of size to the extent of the production required, and as tin is soluble by all or most of the mineral, and some of the

vegetable acid, that any of such acids may be used for dissolving the metal, although I prefer and use the muriatic acid, and I further declare that the strength of the acids and solutions employed may be varied, modified, and reduced according to the quantity of precipitate or revived metal required. And I also use starch in preference to other mucilaginous or cohesive substance, as being more easily reduced to the consistency required by the nature of the work to be performed. And I declare that I do not claim as my invention either the solution of the tin or metal employed by means of muriatic or other acid, or the reviving or reforming of the tin or other metal, that process being well known, or any part of my process taken separately, as the various operations, are of constant occurrence, in different manufactories; but I do claim as of my sole invention, the combination and employment of the several operations, of reforming the tin or other metals, in a state of fine powder, the application of the metal, in that state to the fabric used, and the use of a high degree of friction to raise a metallic surface or figure, at a much less expense than has hitherto been effected, such a result having been heretofore produced by methods in which these combinations have not occurred, and I claim such process whether the whole be effected by hand or manual labour, or by the use and adaption of any machinery to the purpose; And I further declare that although I have in the foregoing description exhibited my invention of giving a metallic surface to cotton, silk, linen, and other fabrics, by the employment of tin only yet the same process may be used with corresponding results, whether that metal or silver, lead, bismuth or antimony, either separately or in combination, is or are the metal or metals employed. And I therefore claim as my invention, the process or method of giving a metallic sur-

face to cotton silk, linen, and other fabrics by the application of a metallic powder in manner hereinbefore expressed whether the metal employed be tin, silver, lead, bismuth or antimony separately or in combination, and where the metal or metals employed is or are first reduced to a powder, and where after its application friction shall be used in raising the metallic surface.—[*Entered in the Roll's Chapel Office, July, 1830.*]

Specification drawn by Mr. Newton.

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## AMERICAN PATENT.

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*Specification of a patent for a machine for Grinding Flax Seed, and other kinds of grain, paints, medicines, and other substances. Granted to ASAHEL CROSS, and EZRA BROWN, Cazenovia, Madison County, New York, February 4th, 1830.*

ON a horizontal shaft two feet six inches, or three feet in length, and ten inches from one end of the same, is placed a cast-iron wheel, eighteen inches in diameter, and one inch, or more, in thickness ; the flat sides of which are turned straight and smooth. Two cast iron wheels or cylinders, nine inches in diameter and four inches in thickness, the circular surfaces of which are turned straight and smooth, are placed on two shafts, two feet in length and near one end of the same. These shafts are placed in a horizontal position across, and at right angles with, the first mentioned shaft, and from three to four inches below the same (measuring from centre to centre) one on each side of the flat wheel, and in such a manner

as to bring the smooth surfaces of the cylinders in contact with the smooth sides of the flat wheel ; the outer ends of the cylinders extending as far as the outer extremity of the flat wheel at the point where they come in contact. The pivots on the ends of all the shafts run in boxes of metal, or other substance, attached to a frame prepared for the purpose.

The perpendicular flat wheel constitutes the principle of the improvement in the above machine, by operating between two cylinders or rollers, similar to those heretofore in use.

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#### *Operation.*

This machine is propelled by water, hand, or other power, by attaching a pulley and strap, or other gear, to each shaft. The seed, &c. is fed from above into the machine, on each side of the flat wheel, between that and the cylinders. The flat wheel and cylinders are put in motion in a direction calculated to draw the feed between them ; the flat wheel and cylinders making an equal number of revolutions in the same time. For some uses, this machine may be made much smaller than above described ; but the flat wheel and cylinders should be nearly in the same proportion to each other.

The principle of this machine in its operation, in its improved form, is, it breaks the seed or substance, and at the same time, by the raking motion of the flat wheel against the cylinders, in consequence of their being placed below its centre, it effectually grinds or pulverizes it.

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## R E P O R T

Of the Select Committee of the House of Commons on the  
Laws of Patents.

(Continued from page 297.)

Mr. John Farey, again called in ; and examined.

WHAT papers have you brought with you ?—A list of our Acts of Parliament, and decisions of courts of law, relative to royal grants by letters patent ; a list of the number of English patents granted in each year since 1796, with an enumeration of a few of the most important ones ; an edition of the foreign laws of patents, in the French language, and manuscript translations which I have made therefrom into English ; viz. of the American, the French, the Belgian, the Austrian, and the Spanish laws. These are all the patent laws I have ever heard of except the Prussian, and the Russian law, of which last I learned something when I was in that country a few years ago, but I have not got them in writing ; I think I could procure a copy before next Session. I hope I shall get official copies in the original languages to compare my translations with them ; I have already obtained some such copies, and am promised others ; if the Committee wish my translations to be printed, I will proceed to verify those I can.

What are you prepared to deliver in for printing ?—The American law re-translated into English from an official French translation ; the French law translated into English from the French official edition ; the Belgian law translated into English from a French edition, not official ; the Austrian laws and the Spanish laws translated into English from a French edition, not official.—Since I made the translations I have obtained an authentic American impression of their law, and also an official copy of the Belgian law in Dutch and French ; I will verify the present manuscript of my translations by those, and such other official copies of the laws of each country as I can get before the printing. Of the Austrian and Spanish laws I have not received official copies yet ; but I have no reason to doubt the correctness of the French edition from which I translated.

[The Witness delivered in the same.]

(*Mr. Farey.*) If I may make any remark upon these laws, it is, that they are very superior to our system, and will all be useful to study as models : not to be adopted exactly for this country ; but a selection of some articles (with such modifications as our different state of commerce and manufactures require,) would serve as guides for us.

The great distinction in our state, compared with that of all other countries that I have visited is, the powerful means of execution that we possess ; for money, materials, tools, buildings and workmen are all ready at very short notice to put a new scheme in practice. Also the very active spirit of competition and rivalry with which those extensive means are exercised ; the excessive rapidity and extensive spread of new ideas, by our periodical publications ; the facility of personal intercourse by travelling in public coaches, and by steam ; the very expressive nature of the technical language that is in use amongst all our artizans ; also the established habit that the English have, more than any other people, of associating themselves into bodies and societies to act in concert to effect a common object.

All these circumstances are the great means of our national productiveness ; but under our present system of patent laws those means are unavailable, and are even rendered inimical to the interests of the inventors of new improvements ; because those inventors are bound by law to work in secret, and with their own hands, until they get their patents ; and they must rest all their future claims upon the merit of what they can produce within a very short time after bringing out their ideas from secrecy, and before the knowledge of the invention can be so spread, as to bring those national advantages to bear upon it, in order to give the invention practibility of execution, and that perfection which can only result from practice.

By the time that the inventor has been thus obliged to fix himself definitively, by a specification (in which no amendment can be made), all the powerful means of execution that I have alluded to, come into activity to cultivate the new invention if it is a good one ; and if in the end it happens that what was done privately by the inventor at first, under every disadvantage, is superseded by what can be done openly afterwards, by the united exertions of himself and others in a long course, under every advantage, he is condemned to lose his right, as having failed in law, if not in fact, because whatever he may afterwards do, he must be judged by his specification, without regard to his subsequent practice.

In foreign countries the means of execution are so limited and communication so slow, that the above circumstances are very different ; there, almost every thing depends upon the individual and continued exertions of the inventor, who can derive but little aid from others, but in return he is not so liable to be superseded afterwards ; he can often attain nearly as much perfection in private as openly ; but that perfection is small, compared with what we can do here in public.

The object of our patent law should be, to encourage the

inventor to devote all his means to the cultivation of his new ideas, and to bring all those national means to bear upon them, in order to advance them to that point of perfection, when the public can take them up, and carry them on with some advantage ; and the law should be adapted then to encourage a free public exercise, with the reservation only, of such a tax upon that exercise, as will be enough to reward the inventor, and repay the costs of attaining the first degree of perfection. The terms of a law to fulfil such conditions, must be relative to the existing state of the public means I have alluded to. It may be farther observed that our advanced state, and facilities of practising new arts, does not dispense with the necessity of obtaining a constant accession of new inventions to exercise our activity upon. On the contrary we now require new improvements on our present state, as much as we did formerly to bring us to that state. To enable us to get good inventions, all that are offered must be allowed a fair and sufficient trial, and we must select the good from the bad, by trial alone, for the best judges of these matters cannot determine *a priori* which will turn out good, and which will fail.

Have you any thing else to produce ?—I have some notes which I have put down in writing, of opinions I have had occasion to form at various times, on detached points of patent law, but which were not called for by the questions put to me when I was examined before.

Did you write to Mr. Dyer to request him to attend this Committee ?—I did, but he is in ill health, and cannot leave home.

Will you allow your letter to be produced ?—I wrote him to that effect on the 13th May ; and, with permission, will read an extract from my letter, with another from his reply, which supports what I have just remarked.

“ It appears to me that there is a fundamental error in the “ feeling with which courts of justice take up the subject of “ patent rights ; they assume that the patent is given solely as “ a reward for the disclosure of a secret invention that has “ been concocted by the inventor in private, before he applied “ for his patent, and that the right granted by the patent is “ also conditional on the event, that the secret when disclosed “ in the specification, shall prove in every respect what the “ inventor professed it to be, namely, that it was wholly within “ his own power to have disclosed or concealed it at the date “ of the patent, and when disclosed in the specification, that it “ shall, in that state, be new, ingenious and publicly useful.— “ Upon these premises if the invention becomes known before “ the date of the patent, without the inventor’s act, or if, when

“ disclosed by the specification, it is not what it ought to be, “ the conditional patent becomes void, and cannot be made “ good by any subsequent acts whatever. The propriety of “ making a deficient invention good after it is disclosed is not “ contemplated or provided for, and yet in fact it almost always “ happens, that the inventions which ultimately come to be of “ great public value, were scarcely worth any thing, in the “ crude state in which they emerged from secrecy ; but by the “ subsequent application of skill, capital, and by well directed “ exertions of the labour of a number of inferior artisans and “ practicians, the crude inventions are with great time, exer- “ tion and expense, brought to bear to the benefit of the com- “ munity. The first inventor is not always a person the best “ qualified to go through all this process of training and esta- “ blishing his own secret production in real use ; but whenever “ that is the case, the incompetent inventor would find it to his “ interest to sell his crude ideas to others more qualified to put “ them into successful practice, if such transfer were provided “ for, and encouraged by law.

“ My view of the true policy of a patent law is very differ- “ ent : I consider that patents ought not merely to be viewed “ in the light of rewards for what has been done in secret be- “ fore the patent is granted, but more particularly as holding “ out an inducement and encouragement for doing what requires “ to be done publicly afterwards ; and insuring a competent “ reward for successful exertions in bringing the invention into “ use. I would consider the granting of a patent to be like “ letting out a branch of uncultivated industry on lease for a “ term of years, to some person who is qualified in talent, “ capital and activity, to work that new branch, and bring it “ to a system fit for common and general use amongst inferior “ people, who would not of themselves have had the necessary “ means of establishing a new and imperfect art, although they “ have every facility for adopting and practising an art pre- “ viously brought to tolerable perfection. In chusing such a “ lessee of the new branch of industry, we must of necessity “ give the preference to him who first becomes a candidate “ for the lease, because it is his of right ; but if the prospect “ of successful cultivation is so open and good, that several “ competitors would be willing to take the lease, we should “ encourage a transfer of the right of priority to that one who “ is best qualified to work the lease advantageously. There is “ every probability that he who can obtain from the first can- “ didate a cession or assignment of the right of precedence, “ will be better qualified to work the lease than that first can- “ didate himself, because that cession or assignment is in itself

“ a full acknowledgment of the superior means of the assignee.  
“ Our present patent law takes quite a different view, and looks  
“ with a very jealous eye upon the assignees of inventors ; and  
“ in Parliament they are not allowed to have the right that is  
“ acknowledged to belong to inventors themselves : this is par-  
“ ticularly observable in the House of Lords, who have a  
“ Standing Order (which is in effect a law) that no assignee  
“ of an inventor shall be allowed to bring in a Bill for an ex-  
“ tension of the term of a patent. Hence, if an assignee has  
“ worked ever so much upon an invention that he has pur-  
“ chased, and brought into use for public benefit, he cannot be  
“ allowed to state his case.

To this letter I received an answer from Mr. Dyer, dated the 29th of May, in which he says, “ My own ideas accord entirely with those expressed by you upon the subject of the proper policy of patent law, and especially with reference to the general worthlessness of first ideas of inventions (which is all that can now be secured by patent) unless those first ideas are followed up by extended experiments, and improvements upon the first suggestions. As the law stands now, every patentee must endeavour to avoid any alterations and improvements on his invention, however valuable in practice, lest such alterations should vitiate his right under the patent ; and as to taking out a new patent for improvements, besides the objection on account of the heavy expense of such new patent, it would seldom hold good, because such improvements are made progressively, and are brought into use one after another, almost imperceptibly, in consequence of the experiments and alterations made in the course of extensive practice ; hence such improvements must unavoidably become known to the people employed thereon, long before a patent can be obtained for them, and that previous knowledge, it seems, would be held fatal to the new patent. Also, the existence of a first patent is often deemed sufficient to avoid a new patent for improvements, although by the same inventor, because the first, being for a crude invention, not useful in practice, when executed as described in the specification, that patent fails ; and then the second patent fails on account of the invention being published by the first. I am sorry that my want of health absolutely forbids my going up to attend the Committee.”

Have the goodness to state who Mr. Dyer is ?—Mr. Dyer is an American, and the origin of his settling in this country is worthy of notice. A self-acting machine was invented here thirty years ago, for making wire cards for preparing wool and cotton ; it bended and cut the wires, pricked holes in the leather, and inserted the bended teeth into those holes, by one

operation, without manual labour ; a patent was taken for the invention here, by Messrs. Sharp and Whittemore, in 1799.—The machine was very ingenious, and was made to operate with rapidity ; but the cards produced by it were too coarse and imperfect to be used with advantage in this country, where the art of card-making by hand had previously been brought to great perfection ; the inventor therefore carried his machine to America, where coarse cards were more in requisition ; and as our laws prohibited the exportation of any of our cards, the want of efficient card makers in America rendered a self-acting machine of value there, although not very perfect in its operation ; he succeeded in America so far as to carry on a trade, and by practice improved his machinery, till it supplied the American demand very well. Mr. Dyer, who was at that time a merchant, became acquainted with the invention, and thinking it had attained a state of perfection sufficient to be re-exported to England with advantage, he purchased the invention, and came over here to take out a patent, when the original patent was nearly expired. I prepared the specification for Mr. Dyer's patent, in conjunction with Mr. Nicholson, in 1812, and gave him all the assistance in my power towards establishing a manufactory, which he at first intended to begin in London, but ultimately began one in Manchester. When the cards manufactured by this machinery began to be sent out to the cotton and woollen mills, they were found still too coarse and imperfect for efficient use in England ; and Mr. Dyer, though not originally a mechanician, set himself to study the subject, until he was able to improve the machinery, and make saleable cards by it. His first set of machines were all destroyed by fire, at an early period of his settling at Manchester, and he lost much property ; but in the end that circumstance insured his success, because he made entire new machines, with many improvements that he had found out before the fire, but which could not have been applied with so much perfection by altering the original machines as in making new ones. He was obliged to take another patent for these improvements, and has had other patents since, and has established a considerable trade with advantage.

Do you believe that many useful inventions are lost to the public, from the want of security to inventors, by the present patent laws ?—There are many secret inventions of value, which it is not the interest of the inventors to disclose under the present system ; but they are practised in secret, to a very limited extent by one individual, so that the public derive only a very small benefit from them ; and yet the secret possessors may be getting more than they could get under the present system of patent law, by practising the same invention generally

and openly, and with extensive benefit to the public. This circumstance deserves the attention of the Committee. Many men of great talent are so conscious of their superiority, and have it so generally acknowledged, that they become indifferent to the small accession of reputation that they could derive from adding more inventions to their list; hence they cease to be communicative in cases where it is their interest to keep secrets; and endeavour to realize the whole profit of a very small extent of business, for so long as they can preserve their secret, rather than look to a small share in the profit made by the public on a very extensive open practice, for fourteen years under a patent. For instance, Doctor Wollaston had a mode of preparing malleable platina, which he practised in secret for a long time, and only disclosed it on his death bed, and probably very imperfectly. Mr. Watt invented and made a machine for executing sculptures, which he never disclosed; he shewed me many specimens of the performance in ivory and alabaster, in 1814, and made me a present of one carved by his machine, which proved that it must have arrived at considerable perfection; he died in 1819, and I believe never disclosed that invention any further than as the machine may have explained itself.

I did business formerly for a very ingenious mechanic at Sheffield, named Gilpin, who destroyed himself some years ago; he had a machine for cutting the teeth of cog wheels, and another for making hard steel spindles for cotton spinning. The works he produced by them were most excellent; but he kept the means secret, and I do not think they have been practised with any effect since his death. All those inventions ran great risk of being quite forgotten, and their perfection has really been lost, by the death of the inventors before making complete disclosures; also the practice of them was always very much limited by the secrecy observed. I am not certain that a patent law, without any of the objections that I make to the present ones, would have induced the disclosure of such inventions, and certainly would not of others, which are of such a description that it is easy to practise them, and yet preserve secrecy effectually; they are mostly chemical subjects. Mr. Faraday, of the Royal Institution, could I think, give the Committee information on such subjects, which are not in the course of my studies, and I only know them incidentally. There is a process of refining the raw sulphur or brimstone that comes from abroad, which I am told is now practised in secret at a large manufactory in London, with such success and superiority over the ordinary methods, that they have brought nearly all that trade into their own hands. There is a secret black dye for silk practised in London, by Sir Francis Desanges, which was, I believe, in the

possession of his father before him, and has been preserved secret for a great length of time, although it has been practised to a large extent ; so that they have realised great wealth by it.

There are numbers of medical secrets which are very much boasted of, but as they are out of my line, I can form no opinion if they are really of value. I know of one medical secret, which is of great importance ; and as its value has happened accidentally to come fully to my knowledge, I can speak very positively upon it. It is a peculiar medicine and a mode of treatment, by which the king's evil or scrophula, is effectually and certainly cured, so as never to break out again. My only child was so afflicted with scrophula, as to be in danger of becoming blind, and crippled in his limbs ; I had the best advice, and followed it strictly, until I found that his case was quite out of the reach of any medical assistance in England ; and then I took him to France, to try the skill of that school, but it proved no better, and I was quite in despair. Hearing of this secret treatment, which is practised by a Mrs. Anne Knight, at Dover House, near Arundel, in Sussex, I made very full inquiries into its efficacy, and found that she possesses a certain specific for all scrophulous cases which are not of too long standing. As I felt very averse to submitting my child to any secret treatment, I took great pains previously to satisfy myself of the results of former cases. One was a woman, who had been cured thirty-six years ago by Mrs. Knight's husband, and has never had any return or illness ; she has since married, and had two children, now grown up, and quite healthy ; one of them has a large family, all very healthy children. Another woman was cured permanently by Mrs. Knight about twenty-eight years ago, and has since married, and had eleven children, of whom nine are living and grown up ; they are all most healthy persons. A young man, now twenty-three years of age, was perfectly cured when a child of between three and four years old, and has ever since been quite strong. A young lady, about twenty-five, daughter of a very respectable man in London, was cured thirteen years ago, and has enjoyed very good health ever since. A young man was cured about the same time as the last, and is now twenty-five, a very fine healthy person.—I visited the above individuals, and each one told me of several other cases of persons who had been patients of Mrs. Knight's at the same time with themselves, and were all to their knowledge cured permanently ; and none could tell me of any instance of failure or relapse. Cases of cures of less standing, but equally certain and effectual, were very numerous. The marks and scars that I saw on these persons, showed that they had been severely afflicted ; they all stated that they have now very strong health.

My child has been under Mrs. Knight's treatment more than a year, and is now nearly cured, and a number of other patients have, to my knowledge, been cured by Mrs. Knight, during the time I have attended her with my child. This valuable secret is in the sole possession of Mrs. Knight, who is arrived at an age when she is very likely to die without making any disclosure; and without the communication of that skill and discrimination which she possesses (and which I believe to be necessary for the successful practice), the mere disclosure of the secret of the medicines she uses, would be only a part of the advantage that would arise from complete instructions being given to all medical practitioners, none of whom can now cure scrophula at all. The secret has been in her family a great number of years; but she has given it perfection, by finding out how to apply the peculiar medicines more successfully than her predecessors. Mrs. Knight has not communicated it to her children, because they have not had a medical education, and they would not be allowed to practise by the College of Surgeons. She was herself in practice long before their Act of Parliament was passed, or else she would not be allowed by law, to do what no physician knows how to do. I would recommend most strongly to Parliament to direct an inquiry respecting this secret, that when its value is proved, as I know it can be, a purchase may be made, and all medical men instructed in it, for the public benefit.

It would be a very good measure to reserve a portion of the revenue derived from the granting of patents, to accumulate and form a fund for the purchase of valuable secret inventions, like Mrs. Knight's, which are not likely to be disclosed by the inducement of any patent law, however complete; and also to reward individuals like Mr. Woolf, whose inventions have not come into use during the terms of their patents, but have afterwards become of national importance.

Would you not, in the latter case, rather recommend an extension of the term of the patent?—Not in all cases. If the inventor has brought his invention to such perfection, that others, by merely copying what he has done, can practise it as well as himself, it would be best to throw it open. Mr. Woolf's was such a case; the engines made on his system, by others, since the expiration of his patent, have performed as well as those made in the same interval by himself, and have even obtained a preference in some places; hence the public would probably have gained nothing by confining it longer in his hands; but now that he is seen to be left quite unrewarded for his long exertions, the circumstance, added to others of a similar nature, is very discouraging to men capable of making

similar improvements ; and I am of opinion that the public would gain, by giving him a handsome reward. In other cases, where there are not many persons capable of taking up the new subject, its progress will be greatly promoted by continuing the patent, because that compels the patentee to continue his exertions to extend the practice. That was Mr. Watt's case. If he had abandoned his engine to the public at the time his first patent would have expired, there was then no other person competent to go on with it, and give it that additional perfection which he attained during the prolongation of the term. No law could be made to distinguish between those cases in which patents should be prolonged, and when rewards should be given instead ; but the same discretion that could determine the propriety of an extension, could also decide between that mode and a reward.

With respect to the invention of Dr. Wollaston, he made it profitable to himself ?—He did, and it is supposed to a very considerable amount ; for every one was surprized to find that he left so much money at his death.

He could not have used it exclusively during so many years as he did and left it to his family after his death, if he had taken out a patent for it ?—Certainly not ; and in all such cases where the nature of the invention permits of secrecy being effectually preserved, no inducement of patent right will bring them forth, even if the right is made ever so secure by law ; because the patent would be totally evaded by infringements made in secret, and which could never be proved in law.

Independently of the risk of such secrets being lost altogether, it is a great public loss to keep them locked up ; for they cannot be extensively practised in secret, and the possessors must lay a very heavy tax on the little business they do execute in secret, with their own hands ; also, the processes would be more likely to be improved, if they were made publicly known ; and new applications of the inventions would be made, which are not done whilst they are kept secret. Hence I think that public purchases of many inventions should always be contemplated, and a fund should be provided for that purpose. There are many other inventions where a secure patent would be preferable to attempting to preserve secrecy, although a patent, under our present law, is not preferable. It is scarcely possible to practise some secrets to a profitable extent, for any length of time, without losing them in the end ; for the precautions that must be taken to ensure the secrecy, must tend to cramp and limit the exercise of the invention so much, that only a small proportion of the profit can be realized, that might be made by an open use of it, under a patent, if it were secured

by law and for a long term. The medical secret of Mrs. Knight is an instance of the pernicious tendency of secrecy ; for although the secret has been safely kept in that family for the greater part of a century, they have taken every possible precaution, and by that care have so limited their practice, as to have only gained a very common maintenance by it ; they have refused to send out medicines, for fear of analysis, but stand by to see them taken ; they have employed no assistants to compound the medicines ; and hence ten or a dozen patients at a time, are as many as can be treated with success. Mrs. Knight has rarely had so many as she could have managed, because the better class of persons have a great aversion to a secret mode of treatment by a woman, and will not go into the inquiries that I did, as to its merits. Mrs. Knight's family never put the secret into writing, for fear of accident, and hence it has always been subject to be lost by the sudden death of the possessor for the time. Hundreds of valuable lives have been lost by the scrophula, and most excessive misery endured, which might have been avoided, if this specific had been made generally known to all practitioners thirty years ago ; and probably it might be applied to other uses in medicine.

A process that requires the co-operation of a number of persons for its performance, and the aid of machinery, would almost always be disclosed, if the patent laws were unexceptionable, because it is scarcely possible to keep it long secret.—Messrs. Darwin, of Sheffield, had a means of making rollers of steel, for silversmiths' flattening mills, perfectly cylindrical, and with a most exquisite polish, when quite hard ; they had an exclusive trade for some years ; and also for silversmiths' hammers and anvils, of hardened steel, polished ; but their secret got out, and others now compete with them in some measure.

A machine was used in secret for many years in London, to split hides and skins into two thicknesses, but it became known in time, and others were constructed ; the secrecy that was observed retarded the improvement of it, and it did not perform very well until it became more known, and then it was brought to great perfection.

Mr. Lowry, the engraver, invented a machine for ruling parallel lines, for the shading tints in copper-plate engraving ; and also the use of pointed diamonds for drawing on the copper ; he used it in secret for years, whereby much of his own time was taken up, in secretly doing a common operation with the machine, which any careful person could have done as well as himself, thereby applying less of his time to those exquisite works of art that none but himself were capable of executing ; at length his secret got out, through the workmen they em-

ployed to make and repair his apparatus, and other machines came into use ; he then set young pupils to rule by his machine, and allowed them to work with diamonds.

Mr. Boulton invented and established a mint for coining money at Soho ; he took a patent for it in 1790, but afterwards he found out and applied a method of working the coining presses by a steam engine, by the intervention of air pumps, applied to exhaust air from a receiver, and the effort that the atmospheric air makes to enter into and refill that exhaustion, is caused to operate upon and impel pistons fitted into cylinders, from which the air is drawn away into the exhausted receiver ; those pistons are so applied as to give motion to the coining presses. This method has been kept secret to this day in England, although the coining presses worked by it are publicly shewn in the Royal Mint. Mr. Boulton fitted up a mint for the Empress Catharine in Russia, and he sent out another to Denmark, but the foreigners do not conceal the air-exhausting method of working the presses ; I was allowed to take drawings of the machinery when I was abroad. It is a very valuable invention, which is capable of many other applications. Mr. Hague has recently taken a patent for working tilt hammers by it ; also cranes for unloading goods ; and that method also suggested to him the patent machinery that he has made for extracting the molasses from sugar, which I mentioned to the Committee before.

Many years ago Mr. Watt invented and applied a small instrument which he called an Indicator, to his steam engine ; it indicates what extent of plenum and vacuum is alternately formed within the cylinder, in order to impel the piston when the engine is at work. It is of very important use in giving engine-makers true knowledge how to make good engines ; and it is of very great use to the inventor, just as a hydrometer is to a distiller. He kept it a profound secret for many years, and in 1814, when he published an account of his other inventions, he gave only an imperfect description of a part of this one, without any hint of parts which are essential to the successful use. A complete instrument afterwards fell into my hands in Russia, where it had been made by some of the people sent from this country, with Mr. Watt's steam engines. At my return to England I made one, and also showed several other engineers how to make such for themselves ; and since that time every one of those persons has very greatly improved his practice by the light it has enabled him to throw upon an obscure part of the operation of steam in an engine. One person who had made an indicator from a sketch that I drew for him, has since printed a description of it in a public journal.

infringement, in which the patentee feeling afraid his patent would be set aside, compromised before the trial, and arranged that the trial should go on, but that the infringers should defend themselves so as to secure a verdict to the patentee, and make it appear to the public that the patent was good at law.

The effect of that verdict would be to give the public an idea of the validity of the patent having been tried, when in fact it never had been fairly tried?—Yes, it would; and the conditions of the compromise were, that the infringers should take licences at a very high premium, only part of which was paid; and that all parties should make a common purse, to prosecute and prevent any others using the patent; the patentee granting no more licences. The patent was thus converted into a close monopoly. It would not have been the interest of the patentee to have submitted to this, if he could have enforced his patent in spite of any one. For if he had been sure of maintaining his patent, it would have been more to his interest to have granted as many licences as he could, and thus made the practice of his invention very general; but under the uncertainty, it was better to secure a portion of his patent right by collusion, than to run the risk of losing it altogether by the uncertainty of the law.

Do you think, that in a majority of cases, it is the endeavour of the patentee to word his specification so as to deceive the public, and keep back the real method of practising his invention?—Certainly that is not the fact, in a majority of cases. In my own practice, which is of more than twenty years standing, and has been tolerably extensive, I am certain there has not been one case in a hundred, where the patentee has shown the least disposition to conceal any thing, or control me as to what I should put into the specification. In general, in addition to the most ample communications from themselves, they desire me to go, and send my assistants, to inspect, and make drawings, and trials of their apparatus or machinery, giving orders to their servants for our admission at all times, in their absence, and to answer all our questions; by which means I have sometimes acquired a knowledge of particular properties and results of the invention, sooner than the inventor himself. I have found that a decided majority of patentees desire me to specify in such a style of language, and with such drawings, as they think will do them most honour in their character of inventors.

Patentees would be very stupid to attempt concealment, for such attempts must prove abortive, and would defeat the very object they have in taking a patent, for it would certainly be detected by the first infringer who set about practising the invention, and according to the present law, any concealment

would vitiate the patent right ; but that I think impolitic and often very unjust, because unintentional omissions or obscurities cannot be distinguished from wilful concealments. The examination of the specification which I recommend to be made, before it is received for enrolment, ought to detect and prevent any attempt to conceal, and would ensure disclosure, if the examiners were competent persons. If they were not, or were careless, and allowed an obscure specification to pass, there would always be a complete remedy by giving the courts of law (or other tribunal appointed to try patent rights) a power to inquire into the sufficiency of the specification, just as they do now ; with only this difference, that if they found it defective in description, they should order the patentee to bring an amended specification ; But should not set the patent aside for such insufficiency, unless the patentee refused to make a new specification to the satisfaction of more competent examiners newly appointed for that purpose, but still subject to future inquiry into that sufficiency.

I have been told that patentees for new medicines commonly enrol fictitious specifications, and keep back the secret of the compositions ; but I do not know the fact. Dr. James is said to have done so with his fever powder ; if that is true, such patents can be of no use but to adorn advertisements with the King's arms. If there have been many patentees, who have intended concealment, they have not come to me, and I am certain they can have been only a small proportion of those who have taken patents in the time that I have been in business.

An examination of the specifications that are on record will, I am sure, prove to the satisfaction of any person competent to judge of different stiles of composition, that the bulk of those in which there is obscurity, have been written by illiterate persons, unaccustomed to communicate their ideas. The most suspicious class are those specifications in which the real meaning is buried in a jargon of law phrases, which is better adapted to raise quibbles in a court of law, than to instruct artists in their workshops. It is obvious that such cannot be written by the illiterate inventors themselves ; but the attempts to entangle infringers by legal subtleties and intricacies, does not answer, because the patentees find to their cost, that such puzzling specifications will not support the patents in court ; they are continually set aside. The Judges usually make inquiries of practical men, and if those men get bewildered in law phrases, that is conclusive against the specification, and it is in vain for ingenious counsel to argue, that the words are explicable in law, the court will go by fact, that it is not written properly for artis ts.

[To be continued.]

**New Patents Sealed, 1830.**

To John Ericsson, of the New Road, in the county of Middlesex, engineer, for his having invented or found out an improved engine for communicating power for mechanical purposes.—Sealed 24th July, 6 months, for Inrolment.

To Abraham Garnett, of Demerara, Esq. for his having invented certain improvements in manufacturing sugar.—24th July, 6 months.

To Samuel Roberts, of Park Grange, near Sheffield, in the county of York, silver plater, for his having invented certain improvements in plating or coating of copper or brass, or mixtures of the same, with other metals or materials, with two metals or substances upon each other; as also a method of making such kind of articles or utensils with the said metal when so plated, as have hitherto been made either entirely of silver, or of copper or brass, or of a mixture of copper and brass plated or coated with silver solely.—26th July, 2 months.

To Richard Ibotson, of Poyle, in the parish of Stanwell, in the county of Middlesex, paper manufacturer, for his having found out an improvement or improvements in the method or apparatus for separating the knots from paper stuff, or pulp used in the manufacture of paper.—29th July, 4 months.

To John Ruthven, of the city of Edinburgh, engineer and manufacturer, for his having invented or found out an improved machinery for navigating vessels and propelling of carriages.—5th August, 6 months.

To James Down, of Leicester, in the county of Leicester, surgeon, for his having found out or invented certain improvements in making gas for illumination, and in the apparatus for the same.—5th August, 6 months.

To John Street, of Clifton, in the county of Gloucester, Esq. for his having invented or found out a new mode of obtaining a rotatory motion by water, steam or gas, or

furnaces, forges and other purposes, where a constant blast is required.—5th August, 2 months.

To William Dobree, of Fulham, in the county of Middlesex, gentleman, for his having invented or found out an independant safety boat of novel construction.—5th Aug. 6 months.

To William Lane, of Stockport, in the county of Chester, cotton manufacturer, for his having invented or found out certain improvements in machines, which are commonly known among cotton spinners by the names of roving frames, or otherwise called cove frames, or bobbin and fly frames, or jack frames.—5th August, 4 months.

To Thomas Hancock, of Goswell Mews, Goswell Road, in the county of Middlesex, water proof cloth manufacturer, for his having discovered and invented improvements in the manufacture of certain articles of dress or wearing apparel, fancy ornaments and figures, and in the method of rendering certain manufactures and substances in a degree or entirely impervious to air and water, and of protecting certain manufactures and substances from being injured by air water or moisture.—5th Angust, 2 months.

To William Mallet, of Marlborough Street, in the city of Dublin, in that part of our United Kingdom of Great Britain and Ireland called Ireland, iron manufacturer, for his having invented certain improvements in making or constructing certain descriptions of wheel barrows.—5th August, 6 months.

To Charles Shiels, of Liverpool, merchant, in consequence of a communication made to him by a foreigner residing abroad, for certain improvements in the process of preparing and cleansing rice.—5th August, 6 months.

To John Pearse, of Tavistock, in the county of Devon, ironmonger, for his having invented an improved method of making and constructing wheels, and in the application thereof to carriages.—5th August, 6 months.

To *Æneas Coffey*, of the Dock Distillery, Dublin, distiller, for his having invented certain improvements in the apparatus or machinery used in the process of brewing and distilling.—5th August, 6 months.

To *Marmaduke Robinson*, of Great George Street, Westminster, navy agent, in consequence of a communication made to him by a certain person residing abroad, for certain improvements in the process of making and purifying sugars.—5th August, 6 months.

To *Robert Clough*, of Liverpool, ship broker, for his having invented an improved supporting block, to be used in graving docks and for other purposes.—5th August, 6 months.

To *Sir Charles Webb Dance*, of Heartsbourne Manor Place, in the parish of Bushy, in the county of Hertford, knight, lieutenant-colonel, for his having invented certain improvements in packing and transporting goods.—5th August, 6 months.

To *Samuel Smith*, of Princes Street, Leicester Fields, in the parish of St. James, Westminster, in the county of Middlesex, gun maker, for his having found out and invented a new nipple or touch hole to be applied to fire arms, for the purpose of firing the same by percussion, and a new cap or primer for containing the priming, by which such fire arms are to be fired.—9th August, 2 months.

To *William Palmer*, of Wilson Street, Finsbury Square, in the county of Middlesex, gentleman, for his having invented improvements in making candles.—10th August, 6 months.

To *John Lawrance*, of Birmingham, in the county of Warwick, silversmith, and *William Rudder*, of Ege, in the county of Gloucester, gentleman, for their having invented or found out an improvement in saddles and girths, by an apparatus affixed to either of them.—10th Aug. 6 months.

To Thomas Ford, of Cannonbury Square, Islington, in the county of Middlesex, chemist, nephew and successor to the late Robert Ford, for his having invented certain improvements in the medicine for the cure of coughs, colds, asthmas and consumptions, known by the name of " Ford's Balsam of Horehound."—12th Aug. 2 months.

To John Knowles, of Farnham, in the county of Surry, hop planter, for his having found out or invented a certain instrument or machine for drawing up hop poles out of the ground; previous to picking the hops, and which, by drawing the poles perpendicularly, will greatly save them, as well as prevent the hops from being bruised, called a hop pole drawer by lever and fulcrum.—13th August, 2 months.

To Samuel Roseoe Bakewell, of Whiskin Street, in the parish of St. James, Clerkenwell, in the county of Middlesex, brick and stone ware manufacturer, in consequence of a communication from certain foreigners residing abroad, and subsequent improvements made by himself, for an invention of certain improvements in machinery, apparatus or implements, to be used in the manufacture of bricks, tiles and other articles, to be formed or made of clay or other plastic materials, part of which said machinery is also applicable to other useful purposes.—18th August, 6 months.

To Matthew Towgood, of Dartford, in the county of Kent, paper maker, and Leapridge Smith, of Paternoster Row, in the city of London, stationer, for their having invented an improved mode of applying size to paper.—18th August, 6 months.

To Major General Joseph Gubbins, of Southampton, in the county of Hampshire, for his having invented certain improvements in propelling and giving motion to machinery.—18th August, 6 months.

## CELESTIAL PHENOMENA, FOR SEPTEMBER, 1830.

D. H. M. S.				D. H. M. S.			
1 0 0 0	○ before the Clock 3 sec.	15 1 0 0	○ in conj. with $\zeta$ in Leo				
2 10 0 0	○ in conj. with $\lambda$ in Aquarius	16 14 28	0 Eclipt. conj. or ○ new moon				
2 10 38 0	Ecliptic opposition or ○ full moon.	17 7 0 0	○ in conj. with $\eta$ in Virgo				
2 19 0 0	○ in conj. with $\phi$ in Aquarius	17 19 0 0	○ in conj. with $\text{I} \gamma$ in Virgo				
4 0 0 0	21 Stationary	18 12 0 0	○ in conj. with $\alpha$ in Virgo				
5 0 0 0	○ before the Clock 1 m. 20 Sec.	18 22 0 0	○ in conj. with $\iota$ in Virgo				
5 10 0 0	○ in conj. with $\nu$ in Pisces	19 15 0 0	○ in conj. with $\delta$ in Leo				
6 13 0 0	○ in conj. with $\mu$ in Ceti	20 0 0 0	○ before the Clock 6 m. 30 Sec.				
7 8 0 0	○ in conj. with $\nu$ in Taurus	21 13 0 0	○ in conj. with $\gamma$ in Libra				
8 4 0 0	○ in conj. with $\gamma$ in Taurus	22 1 0 0	○ in conj. with $\psi$ in Libra				
8 6 0 0	○ in conj. with 2 $\delta$ in Taurus	22 17 0 0	○ in conj. with $\phi$ in Oph				
8 11 0 0	○ in conj. with $\alpha$ in Taurus	23 1 51 0 0	○ enters Libra				
9 1 58 0	○ in $\square$ last quarter	24 18 52 0 0	○ in $\square$ first quarter				
10 0 0 0	○ before the Clock 3 m. 1 Sec.	25 .0 0 0 0	○ before the Clock 8 m. 14 Sec.				
12 18 0 0	○ in conj. with $\beta$ . Long. 25° in Cancer.	25 22 0 0 0	○ in $\delta$ in Sagitt				
	○ lat. 5° 6' N. $\beta$ lat. 1° 9' N. diff. of lat. 13'.	29 1 0 0 0	○ in $\beta$ in conj. with $\alpha$ in Leo				
14 9 0 0	○ in conj. with $\alpha$ in Leo	29 21 0 0 0	○ in conj. with $\lambda$ in Aquarius				
15 0 0 0	○ before the Clock 4 m. 54 Sec.	30 0 0 0 0	○ before the Clock 9 m. 54 Sec.				

The waxing moon ○.—the waning moon ○  
Rotherhithe. J LEWTHWAITE.

## METEOROLOGICAL JOURNAL, FOR JULY AND AUGUST, 1830.

1830.	Them.		Barometer.		Rain in in. ches.	1830.	Thermo.		Baromet.		Rain in in. ches.
	Hig.	Low	High.	Low.			Hig.	Low	Hig.	Low	
JULY											
26	83	60	30,19	stat.		11	74	54	29,69	stat.	
27	84	60	30,26	30,24		12	70	53	29,78	29,70	,025
28	83	52	30,29	30,21		13	59	53	20,74	29,60	1,025
29	82	58	30,14	30,03		14	61	47	29,83	29,53	,75
30	83	58	29,96	29,86		15	63	47	29,81	29,69	,025
31	79	58	30,02	stat.		16	65	41	29,86	stat.	
AUG.											
1	75	50	29,96	29,84		17	64	38	29,94	29,90	
2	71	50	29,76	stat.		18	62	41	30,14	30,05	,1
3	72	50	29,96	29,91		19	62	39	30,11	30,03	
4	73	48	30,01	29,91		20	61	42	29,92	stat.	
5	75	59	29,86	29,83		21	63	45	29,96	29,93	
6	72	46	29,95	stat.		22	68	38	29,96	stat.	
7	69	50	29,91	29,78		23	67	53	29,96	29,84	,025
8	72	51	29,73	29,71		24	70	52	29,84	stat.	
9	71	48	29,76	29,74		25	68	58	29,76	29,72	,05
10	65	52	29,64	29,62							

produce compound motions for mechanical purposes—Lean's patent: vol. xiv. p. 86.

**ENGINE** for raising water by means of a series of vibrating scoops actuated by any convenient means—Cubanal's patent: vol. xiii. p. 16.

— to produce power, in which a piston is worked by the rising and falling of a fluid acted upon by the vapour of ether—Howard's patent: vol. xiv. p. 181.

— to be worked by the ignition of inflammable gas, being an improvement upon his former—Brown's patent: vol. xiv. p. 319.

— to heat air which is to be applied for working a piston by its expansive force—De Rosen's patent: vol. i.\* p. 156.

— for generating power on the lazy tongs principle, to be actuated by manual labour—Holland's patent: vol. i.\* p. 346.

— worked by the expansion and contraction of air, the temperature of which is to be suddenly varied—Parkinson and Crosley's patent: vol. i.\* p. 299.

— in which heated air is proposed to be used mixed with the steam to promote its elastic force—Hall's patent: vol. ii.\* p. 59.

— an attempt to obtain mechanical force by a band of sponges distended over rollers, with a band of leaden weights embracing them. The lower part of the band of sponge being placed in water, capillary attraction will cause the water to rise in the sponge on one side, while the weights will express the water from the sponge on the opposite side, and thereby produce that preponderance which will cause the whole to revolve—Congreve's patent: vol. ii.\* p. 287.

— with a cylinder and piston to be worked by hot and cold air—Stirling's patent: vol. iii.\* p. 245.

— for generating power by a combination of vibrating levers—Atterley's patent: vol. iii.\* p. 301.

— for obtaining power by a com-

pound leverage—Nicholl's patent: vol. iv.\* p. 35.

**ENGINE**, observations on the same patent: vol. vi.\* p. 64.

— for producing a reciprocating action from a rotary, by means of two toothed wheels working in a hollow rack—Par and Bluet's patent: vol. vi.\* p. 131.

— in which iron balls are raised by an Archimedes screw, and let fall at top on to the machinery to be driven: vol. v.\* p. 156.

on the rotary principle, having a revolving piston intended to be driven by water, wind, or steam—Strat's patent: vol. vi.\* p. 70.

— for obtaining power by means of water, steam, or other fluid, passed through a sort of rotary apparatus, consisting of a ball and flange working in a spherical box—Dakeyne's patent: vol. ix.\* p. 19.

— consisting of a chain of buckets carried round in an endless series by the weight of water descending from a height—Nevill's patent: vol. ix.\* p. 141.

— for locomotion by a horse made to exert the muscular force of his legs against a receding floor—Brandreth's patent: vol. ix.\* p. 187.

— to be worked by elastic gas in the same manner as low-pressure steam—Torren's patent: vol. ix.\* p. 200.

— See *Steam-engine*.

**ENGINEERS**, Civil, Society of, their institution and objects: vol. i. p. 221.

**ENGRAVING**, improvements in, for producing Bank notes, by transferring various styles, and incorporating them in one plate—Perkins's patent: vol. i. p. 159, 256.

— a new process of: vol. i. p. 55, 78.

— on steel, claimed by the French: vol. i. p. 383.

— and etching, rollers for calico printing: Bradbury's patent: vol. iii. p. 240.

— on steel, and etching, by means of a new menstruum: vol. xiii. p. 42.

— on ivory and biting with a solution of nitric acid and soda: vol. xiii. p. 104.

**EOLIAN HARP** on a gigantic scale, and novel construction: vol. x. p. 324.

**EPSOM SALTS**, an improved process for making, by the use of sulphate of lime and carbonic acid—Grisenthwaite's patent: vol. vi.\* p. 22.

**EVAPORATION** of liquids, improved apparatus for, by a coil of pipe heated by steam, between which the liquid falls in a shower—Cleland's patent: vol. v. p. 291.

— by removing the pressure of the atmospheric air—Arnott's patent: vol. v. p. 225.

— by injecting a current of heated air into the liquor—Knight and Kirk's patent: vol. v. p. 295.

— by the heat of the steam evolved from the several vessels placed one over the other, containing the liquid under operation—Johnson's patent: vol. x. p. 295.

— by causing the liquor to descend in a shower through a current of cold air—Cleland's patent: vol. i.\* p. 162.

— by the introduction into the liquid of a rotary worm heated by steam—Cleland's patent: vol. i.\* p. 359.

— by forcing currents of hot or cold air through the—Kneller's patent: vol. iv.\* p. 321.

— the heat of the steam evolved is carried back to the furnace for the purpose of economy—Church's patent: vol. viii.\* p. 1.

— by a circuitous flue passed through the evaporating vessel—Gibbs's patent: vol. viii.\* p. 16.

— principally applying to the crystallization of salt (which see)—Furnival's patent: vol. viii.\* p. 145.

— for the crystallization of sugar by a rotary fan producing a draft of air above—Aitchison's patent: vol. vii.\* p. 220.

— by an apparatus in which the vapour rises through a serpentine channel to a water chamber above—Shand's patent: vol. ix.\* p. 184.

**EXPANSION** of gas under different temperatures, applied as a means of generating power for moving machinery—Brunel's patent: vol. xii. p. 1.

**EXHIBITION** of transparent scenery with shades, called the diorama—Arrowsmith's patent: vol. ix. p. 337.

**EXCAVATING** for canals by a machine in which vibrating peckers break the ground, and travelling buckets collect the earth as in a dredging apparatus—Palmer's patent: vol. vii.\* p. 314.

**EXTINGUISHING** fire by wearing a fire-proof dress—Dean's patent: vol. ix. p. 341.

— by an apparatus which indicates the direction of an inaccessible fire on ship-board—Dodd's patent: vol. xi. p. 192.

**EYE-GLASS** with springs in its frame which converts it instantly into spectacles—Bate's patent: vol. xi. p. 243.

**EYE**, instrument for extracting the cataract from, by a spring lancet—Williams's patent: vol. xii. p. 144.

— remarks on: vol. ii.\* p. 53.

**FACE-GUARD** for smelters: vol. xiv. p. 333.

**FATITIOUS** airs, their successful application to the cure of disease: vol. vii. p. 39.

**FACE-SIMILE** impressions of types and plates, mode of multiplying—Congreve's patent: vol. v. p. 185.

**FARINA** from carrots, turnips, and various vegetable matters—Goulson's patent: vol. viii.\* p. 31.

**FASTENINGS** for doors, and a sort of lock shooting several bolts in different directions—Ward's patent: vol. viii. p. 303.

— for windows, self-acting, with spring bolt and tumbler—Loach's patent: vol. xiv. p. 187.

**FAT**, a machine for cutting, by means of circular knives, preparatory to melting—Gardner's patent: vol. iii p. 290.

**FATTY** substances, a new preparation of, for producing light—Maniclor's patent: vol. xii. p. 225.

— See Tallow and Candles.

**FENDER** for fire-places, constructed with sliding parts, in order to expand or contract to different lengths—Ibbotson's patent: vol. v. p. 182.

**FENDERS**, improved mode of ornamenting, by a process called *close plating*—Spriggs' patent: vol. vii. p. 64.

— made to expand or contract in curved directions—Eyre's patent: vol. vii. p. 134.

**FELTING** the bottoms of ships between the wood and copper—Williams's patent: vol. ix.\* p. 134.

**FERMENTATION** for the production of vinegar by the introduction of acids into the worts.—Le Grand's patent: vol. viii. p. 135.

— See also Distillation and Evaporation.

**FERRY-BOAT** of a peculiar construction: vol. vi. p. 152.

**FICUS INDICA**, an enormous tree in Guzerat: vol. i.\* p. 57.

**FID** for supporting the topmast of a ship, constructed on the lever principle—Rotch's patent: vol. ix. p. 177.

— by sliding bolts or wedges—King and Kingston's patent: vol. xi. p. 293.

— by sockets and screws—Sapping's patent: vol. xiv. p. 194.

— by snails or eccentric rollers—Prior's patent: vol. v.\* p. 261.

— by a cylinder having a flat post taking into a notch in the foot of the masts—Brooking's patent: vol. v.\* p. 264.

— by a transverse bar raised or lowered by screws—Pearce and Gardner's patent: vol. vii.\* p. 332.

**FILES** for preserving papers from dust, which are to be secured between book lids by a string—Garbutt's patent: vol. x. p. 299.

— for smoothing and polishing metals constructed of thin steel plates, to be attached to wooden blocks—Cook's patent: vol. xiv. p. 31.

— or portfolio for papers, to be secured by a string between book lids—Hawkins's patent: vol. xiv. p. 298.

— machine for cutting or indenting steel by pressure: vol. iii.\* p. 270.

**FILTRATION** by an apparatus in which the pressure of the air above forces the liquor through into an exhausted vessel below—Tritton's patent: vol. i. p. 84.

**FILTRATION** effected by compressing a cotton bag into a small tube, and the liquor, in passing, will deposit its foul parts in the folds, and become pure—Schroeder's patent: vol. x. p. 361.

— by a tub divided into compartments with false bottoms, as strainers filled with sand and matted horse-hair—Suwerksop's patent: vol. xi. p. 304.

— by an apparatus in which water is made to flow upwards by the pressure of a superincumbent column—Chambers and Jeppard's patent: vol. xi. p. 245.

— by a simple apparatus containing sand, charcoal, and silica: vol. i.\* p. 234.

— of water, the philosophy on which its purification depends: vol. ii.\* p. 99.

— by an apparatus having a peculiar arrangement of layers of sand, charcoal, sponge, and flint—Fourville's patent: vol. iv.\* p. 206.

— by an apparatus in which slabs of slate are connected, forming zig-zag passages for the water to rise through—Stirling's patent: vol. iii.\* p. 50.

— upwards through purifying materials, by the superincumbent pressure of a descending column of water—White's patent: vol. iv.\* p. 323.

— of the river Thames to supply fresh water to London, a mode of effecting: vol. vii.\* p. 1.

— in a vessel of earthenware, having perforated partitions and layers of sand, cinders, coke, and a horse-hair covering, through which the water is to be forced upwards—Bell's patent: vol. vii.\* p. 88.

**FIRE** and burglary alarm, by lines or wires leading from different parts of the premises to the apartment of the proprietor. On opening a door, or burning of a thread, a trigger goes off, and the other end of the line or wire rings a bell, and also exhibits a placard indicating the place from whence the alarm came—Glenny and Darby's patent: vol. i. p. 269.

— alarm, constructed on the princi-

ple of a thermometer, in which the heat of the apartment raises the mercury, and causes a piston to lift a lever and liberate a catch, which sets off the alarm—Colbert's invention: vol. i. p. 380.

**FIRE-SHIELD**, to be used by a person entering premises on fire: vol. ii. p. 451.

— proof, a chemical process to render timber, clothing, &c.—Cook's patent: vol. v. p. 235.

— grate, the construction and object of which is not clearly shown—Richard's patent: vol. vi. p. 191.

— escape, formed by an iron balcony, which, by letting off a spring, becomes a ladder: vol. vi. p. 91.

— works, consisting of rockets with parachutes, by which they may be suspended in the air—Congreve's patent: vol. viii. p. 63.

— damp, notice of an apparatus to descend mines in case of, or enter buildings on fire: vol. ix. p. 258.

— dress and apparatus to be worn by persons entering rooms or other places filled with smoke—Dean's patent: vol. ix. p. 341.

— engine or pump, notice of one made in Switzerland, on a novel construction: vol. x. p. 371.

— proof composition, consisting of alkali and granulated earth, with which timbers are to be coated: vol. x. p. 275.

— grate, or domestic stove, in which the fuel is introduced in a box behind—Atkins and Marriott's patent: vol. xi. p. 73.

— escape, a sliding ladder attached to the upper story of a house, in order to escape on to the roof—Rickman's patent: vol. xi. p. 25.

— extinguishing machinery, designed to direct the jet of an engine to any particular part of an inaccessible apartment—Dodd's patent: vol. xi. p. 192.

— proof cement or mastic, made by a compound of milk, vinegar, white of egg, and lime: vol. xi. p. 272.

— place, fed with coal from a box behind the grate, to be raised up by a winch when fuel is required—Lloyd's patent: vol. xii. p. 349.

**FIRE-PROOF** buildings, constructed with cast-iron joists, for supporting the floors and ceilings, the interstices between which are to be filled up with bricks or stones—Farrar's patent: vol. xii. p. 358.

— wood, an apparatus for cutting, splitting, and making up bundles of—Weathersey's patent: vol. xiii. p. 128.

— damp, an apparatus to ignite the gas in the mine as it generates, in order to prevent mischief—Wood's patent: vol. xiv. p. 94.

— guard, made of iron chains and rods, cheap and portable: vol. i.\* p. 48.

— proof composition: vol. ii.\* p. 226.

— escape, a cradle made of web, is suspended by a rope, which is passed through a ring in the lintel at top of the house: vol. iii.\* p. 159.

— places, a peculiar construction of stove or grate for heating rooms—Fonzi's patent: vol. v.\* p. 199.

— extinguishing engine, worked by steam—Braithwaite and Ericsson's patent: vol. v.\* p. 242.

— grate, for rooms, having air passages behind, and a reflecting dome in front—Gaunt and Eckstein's patent: vol. viii. p. 78.

— escape, consisting of a large sheet of canvas, into which persons are to throw themselves from any height, without danger: vol. viii. p. 265.

**FIRE-ARMS**, improved mode of discharging, by a detonating composition—Fox's patent: vol. i. p. 101.

—, the introduction of a safety chamber into a gun barrel—Dell's patent: vol. i. p. 328.

—, improved construction of detonating lock for Webster's patent: vol. iii. p. 72.

—, novel construction of lock for discharging—Richards's patent: vol. iii. p. 225.

—, improved sear of a lock for fowling-pieces, &c.—Manton's patent: vol. iii. p. 71.

—, a priming magazine or chamber

attached to the side of the barrel—Egg's patent: vol. v. p. 119.

**FIRE-ARMS.** a revolving piece attached to the lock, containing two touch-holes—Davis's patent: vol. vi. p. 18.

—, a self-priming magazine lock—Jackson's patent: vol. vii. p. 72.

—, improvement in the lock, on the detonating principle, rendering it compact—Day's patent: vol. vii. p. 290.

—, the substitution of an helical spring, for impelling the cock or hammer, instead of the ordinary main spring—Cook's patent: vol. ix. p. 297.

—, a simplification of the lock for discharging by percussion—De Berenger's patent: vol. x. p. 129.

—, an improved lock for discharging—Riviere's patent: vol. xi. p. 10.

—, a bolt or stop in the lock, for preventing the accidental discharge of—Somerville's patent: vol. xi. p. 12.

—, a bolt behind, to lock the trigger, and prevent the accidental discharge of: vol. xi. p. 100.

—, the cock of the lock, having a magazine containing the priming—Cartmel's patent: vol. xi. p. 126.

—, discharging by the sudden compression of a volume of air, which produces ignition—Newmarch's patent: vol. xii. p. 72.

—, to be loaded with several charges in one barrel, and discharged at several touch-holes perforated along the barrel—Mould's patent: vol. xii. p. 145.

—, a mode of conducting the detonating priming from a stationary magazine to the touch-hole—Manton's patent: vol. xii. p. 169.

—, placing the nipple which receives the detonating cap behind the breech, and covering it to prevent accident—Davis's patent: vol. xii. p. 251.

—, to facilitate the rapid discharge of, by supplying several loadings at once to the barrel, and discharging them separately—Hunout's patent: vol. xiii. p. 72.

—, improvements in the mechanism of the lock, by a novel construction of main spring—Downing's patent: vol. xiii. p. 135.

**FIRE-ARMS**, improvements in gun barrels, which are proposed to be made elliptical in the bore—Beever's patent: vol. xiii. p. 142.

—, introducing the priming, and igniting the powder at the breech—Newmarch's patent: vol. xiv. p. 76.

—, the adaptation of a rest to the butt of a fowling-piece, for the purpose of steadyng it in the act of firing—Mills's patent: vol. ii.\* p. 20.

—, an appendage to the lock to prevent its accidental discharge: vol. ii.\* p. 221.

—, an improved walking-stick gun—Dickson's patent: vol. iii.\* p. 138.

—, a shield, covering the touch-hole of a fowling-piece, and a pin containing the priming—Richards's patent: vol. vii.\* p. 135.

—, the application of a bent lever in place of the tumbler of a gun lock—Lacy and Davis's patent: vol. viii.\* p. 83.

—, a means of allowing the fulminating powder to escape from the touch-hole when exploded—Manton's patent: vol. ix.\* p. 133.

—, a gun lock of peculiar construction—Lawrance and Crundwell's patent: vol. ix.\* p. 206.

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—, by a decoy, thrown overboard, and allowing the vessel to drive under fore-sails—Coffin's patent: vol. vii.\* p. 192.

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—, process and machinery for preparing and bleaching—Lee's patent: vol. i. p. 186.

—, a substitute for, found in certain

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— machine, for breaking, notice of a new: vol. v. p. 306.

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— machine, for heckling, combing, &c.—Garsed's patent: vol. xiii. p. 185.

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—, machinery for separating the seeds from, breaking the boom, opening the fibres, combing and brushing—De la Garde's patent: vol. xiv. p. 191.

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—, machinery for preparing and dressing—Lawson and Walker's patent: vol. iii.\* p. 83.

—, improved process of preparing: vol. iii.\* p. 274.

—, machine for dressing: vol. v.\* p. 90.

—, machine for grinding the seeds of: vol. v.\* p. 354.

—, machine for heckling or dressing the fibres of—Taylor's patent: vol. vi.\* p. 4.

—, process of preparing, for the use of shoemakers, saddlers, &c.—Bartlett's patent: vol. vi.\* p. 94.

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—, improved machinery for dressing, the bolting cylinder having iron ribs, and a cleaning brush—Smith's patent: vol. iv.\* p. 344.

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—, process of preparing the substitute—Goulson's patent: vol. viii.\* p. 31.

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— a meter for measuring the passage of, and ascertaining the strength of—Arnold's patent: vol. ix. p. 177.

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 —, a combination as above, with anthracite, which burns without smoke—Christie and Harper's patent: vol. x. p. 122.  
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— machine in which the beaters are worked by a crank and jointed rods—Jobbins's patent: vol. v.\* p. 81.

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— by a machine having vibrating saw blades—Bainbridge's patent: vol. vii. p. 228.

— machine for plucking out the hairs by rotary pincers—Ball's patent: vol. viii.\* p. 64.

**FUR**, separating the kems and hairs from by a blowing apparatus—Barker and Harris's patent: vol. iii. p. 119.

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— having a screw plug with a disc at bottom to close the aperture, which is made tight by an elastic pad or collar—Gossage's patent: vol. i.\* p. 338.

— made of lead, or an alloy with antimony, which will render them less likely to break than if made of brass—Hall's patent: vol. ii.\* p. 23.

— the valve formed by two parallel plates, and the plug brought down tight by a helical spring—Ross's patent: vol. iii.\* p. 243.

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— formed of stamped metal soldered together with the internal part of the barrel cast—Rudder and Martineau's patent: vol. vii.\* p. 332.

— a conical plug fitting into a corresponding seat is raised and depressed by a screw stem turned by a lever attached to the nozzle—Dixon and Vardy's patent: vol. viii.\* p. 205.

**COFFEE**, apparatus for the preparation of, by forcing boiling water through the coffee, the pressure of steam generated by a lamp in a lower vessel causing the water to rise into a receptacle above—Rabant's patent: vol. vi. p. 297.

— roasting, in a close stove, which causes the aqueous parts to evaporate, and retains the oily or aromatic—Evans's patent: vol. ix. p. 72.

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sides by the hot water—Dunn's patent: vol. xii. p. 28.

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— peculiar mode of securing the lid after the body has been introduced into the coffin, by means of screws, the heads of which are case-hardened, and formed with screw sockets, and are turned by a counter-screw, instead of a key or screw-driver—Butler's patent: vol. xi. p. 236.

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— a preparation of, for making candles and soap—Soaines's patent: vol. v.\* p. 148.

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— and medalling, improvements in, by the attachment of raised rims round the edges of, for protection—Thomason's patent: vol. xiv. p. 373.

**COMPASS**, for steering on shipboard, to prevent the injury occasioned to the needle by concussions, and to regulate the vibrations by a weight—Phillips's patent: vol. xi. p. 181.

— a new solar, constructed by M. Watt, Esq.: vol. i.\* p. 303.

— mariner's, improved mode of fixing on shipboard: vol. ii.\* p. 226.

**COPPER**, in solution, converted to a blue colour: vol. i. p. 458.

— quantity raised in Great Britain and Ireland: vol. iv. p. 163.

— soluble in ammonia: vol. viii. p. 219.

— mode of improving the quality of, by an alloy, for sheathing ships—Mushet's patent: vol. viii. p. 246.

— white, alloy of, how made: vol. x. p. 156.

**COPPER**, improvements in promoting the fusion of ore, when in the state of regulus—Jones's patent: vol. vi.\* p. 21.

**COOKING**, apparatus for, called the philosophical, by a peculiar arrangement of ovens and flues — Cook's patent: vol. i. p. 419.

— stove, of a peculiar construction, and insulated—Heard's patent: vol. ii. p. 110.

— by a roasting jack with combined springs—Lane's patent: vol. ii. p. 430.

— kitchen range for, having a peculiar formation and disposition of the parts, without any feature of novelty beyond arrangement — Slater's patent: vol. iii. p. 231.

— portable apparatus for, suited to camp-equipage—Eckstein's patent: vol. iv. p. 1.

— the novelty consisting of a cover or frame to be placed upon an ordinary hot plate—Postan and Jeakes's patent: vol. iv. p. 243.

— spring jack, and its connexions to a roasting apparatus—Pearse's patent: vol. v. p. 184.

— by a smoke jack, in which the flyer turns in the chimney in a vertical direction — Thin's patent: vol. xiii. p. 84.

— a portable oven heated by a lamp—Cochrane's patent: vol. xiv. p. 150.

— combination of boiler, oven, and hot closet, the fire-place being situate in the middle—Bellingham's patent: vol. xiv. p. 257.

— apparatus consisting of a ship's hearth—Williams's patent: vol. xiv. p. 359.

— oven and fire-place, enclosed and surrounded by reflectors: vol. ii.\* p. 100.

— a portable oven and steam-boiler, heated by the flame of a lamp—Cochrane's patent: vol. vii.\* p. 283.

— a portable apparatus as a ship's hearth, and a permanent kitchen range suited to a mansion; the novelty, if any, is in the arrangement—Fraser's patent: vol. xiv. p. 147.

**COOLING** fluids. See Refrigerators.

**COMET**, proof of, revolving on its axis: vol. xiii. p. 56.

**CONDENSATION**. See Steam-engines and Distilling.

**COPYING** machine, notice of one, for the pocket: vol. ii. p. 70.

— a convenient portable press for, Brunell's patent: vol. ii. p. 248.

— oil paintings, by lithography: vol. xiv. p. 100.

**CORDAGE** prepared with caoutchouc to prevent rotting—Hancock's patent: vol. xi. p. 313.

— prepared with corrosive sublimate, &c, to prevent decay—Dempster's patent: vol. xiv. p. 136.

— of silk grass, dried, beaten, and heckled—Harris's patent: vol. vi.\* p. 83.

— prepared with a tanning material to preserve it from rotting by damp—Robertson's patent: vol. vi.\* p. 336.

**CORK**, machinery for cutting, by a circular knife—Thompson's patent: vol. i. p. 28.

— notice of a simple one in France: vol. xi. p. 269.

**CORKING** bottles by the force of a lever in a small machine — Masterman's patent: vol. xii. p. 244.

**CORN-MILL**, improved mode of fixing the bed-stone of: vol. ii. p. 283.

— drying apparatus for, having a spiral passage: vol. xiv. p. 46.

— mode of preserving, by inverting a large sheaf over the stack of sheaves as an umbrella—Vazie's patent: vol. iii. p. 193, 265.

— the French portable military mill for grinding, with improvements—Deveraux's patent: vol. ix. p. 393.

— mill, an economical one, worked by a horse or ox: vol. xii. p. 261.

**COUCH** to prevent sea-sickness, by a spring seat suspended on gimblies—Pratt's patent: vol. xii. p. 149; vol. xiii. p. 117.

— or bed for invalids—Newton's patent: vol. iii.\* p. 156.

**COUPLING** bands or straps for machinery, by means of a screwed stud: vol. vi.\* p. 169.

Cow, structure and functions of the udder of: vol. ii. p. 307.  
 — winter food for: vol. xiii. p. 58.

CRADLE for rocking children, a self-moving: vol. vi.\* p. 97.

CRANK, substitute for, by pinion and reciprocating rack—Aldersey's patent: vol. ii. p. 267.  
 — on the power of the, when applied to machinery: vol. iii. p. 252.  
 — on the principles of, as a mechanical agent: vol. iii. p. 302.  
 — improved construction of, for bells—Burt's patent: vol. ix. p. 235.  
 — machinery for superseding the, in steam-engines—Barlow's patent: vol. ii.\* p. 62.  
 — substitute for, by rack and pinion, Apsey's patent: vol. iv.\* p. 82.

CRANE, portable, for raising and lowering casks, &c., in the interior of warehouses, notice and observations on: vol. xiv. p. 96, 156, 208.  
 — improved construction of—Wright's patent: vol. v.\* p. 185.  
 — and tilt hammers worked by an atmospheric engine—Hague's patent: vol. i.\* p. 94.  
 — or mechanism for raising weights by the conversion of a reciprocator into a rotary action—Revis's patent: vol. viii.\* p. 185.

CRAPE, improved method of disposing the warp threads of the silk in weaving—Grout's patent: vol. iii. p. 298.  
 — of a peculiar kind, with satin stripes—Francis's patent: vol. vii. p. 238.

CREAM from milk, an improved mode of extracting: vol. vii.\* p. 161.

CRIMPING, plaiting, and goffering machine for the laundry—Turner's patent: vol. ix. p. 251.

CROPPING or mowing grass plats and lawns, by a machine having a rotary spiral cutter—Budding's patent: vol. vi.\* p. 196.  
 — woollen and other cloths. See Shearing.

CRONON oil, its medicinal properties: vol. iii. p. 259.  
 — mode of extracting from the nuts—Conwell's patent: vol. iv. p. 236.

CRUCIBLE, an improved method of forming: vol. i. p. 295.

CRUTCH, an improved, having an elastic bearing: vol. i. p. 446.

CRYSTALLIZATION. See Sugar and Salt.

CUBEBS, efficacy of, as a medicine: vol. iii. p. 259.

CUPPING, improved apparatus for—Kennedy's patent: vol. xiv. p. 193.

CURVES, instrument for drawing: vol. vii. p. 48.

CUTANEOUS absorption, a spirituous and mercurial preparation, as a cure for disease acquired by—Mettemberg's patent: vol. xiii. p. 90.

CUTLERY, steel edges applied to silver knives, &c.—Thomason's patent: vol. ii. p. 184.  
 — securing the blades of knives, &c., in handles—Brownill's patent: vol. i. p. 351.  
 — apparatus with cylindrical files, of giving a fine edge to—Felton's patent: vol. i.\* p. 41.  
 — apparatus with diagonal files for sharpening knives, &c.—Westby's patent: vol. ii.\* p. 201.  
 — two file-edges, attached as a cross to a fork, for sharpening knives—Rodgers, Hobson, and Brownill's patent: vol. iii.\* p. 42.  
 — apparatus for sharpening, by means of files on two bevel-edged discs in contact—Church's patent: vol. v.\* p. 138.  
 — peculiar mode of mounting a hone for sharpening razors, knives, &c.—Westby's patent: vol. v.\* p. 190.  
 — the attachment of metallic backs and handles to saws, clevers, straw-knives, and other cutting instruments, in a peculiar manner—Gill's patent: vol. vii. p. 74.  
 — cases or scabbards for swords, knives, scissors, &c., in a new way—Gunby's patent: vol. ix. p. 17.  
 — knives made from steel by rolling, the shoulders, &c. being formed by recesses in the rolls—Smith's patent: vol. ii.\* p. 153.

CUTTING and preparing lay or ley ground for tillage, by a rotary scari-fyer—Thomas and Lobbs's patent: vol. ii. p. 250.

**CUTTING** fat for melters in a machine, having a series of circular cutters fixed upon a cylinder, the edges of which act against the periphery of a roller—Gardner's patent: vol. iii. p. 290.

— and shaping irregular forms of wood in a peculiar sort of lathe, in which the action of the cutters is guided by a model form—Buckle's patent: vol. v. p. 238.

— hard steel by a disc of soft iron made to revolve very rapidly: vol. vi. p. 205.

— the fur off skins by a pair of fine saws put in rapid reciprocating lateral motion—Bainbridge's patent: vol. vii. p. 228.

— or sawing and grooving marble and other stone, by a reciprocating saw worked in a guide by steam power—Tullock's patent: vol. x. p. 359.

— timbers into planks, by two circular saws, the axis of one being above the log, that of the other below, and their peripheries extending beyond each other, so as to cut completely through at one operation—Sayner and Greenwood's patent: vol. xi. p. 364.

— and splitting fire wood, and binding it into small bundles for sale, a machine for—Weatherley's patent: vol. xiii. p. 128.

— paper cards, &c. in a machine, which causes the edges to be perfectly at right angles to each other: vol. i.\* p. 198.

— furs from skins, for the use of hatters, by a machine having a rotary cutter with twisted blades—Baring's patent: vol. iii.\* p. 34.

— rags for making paper, by a machine having rotary cutters which act against a fixed blade, the rags being fed in by rollers: vol. iii.\* p. 268.

— wood into mouldings, rebates, &c., by a rotary cutter, the wood being slides along the bed—Marbot's patent: vol. iv.\* p. 202.

— paper, which has been made

broad and in very great lengths, into narrow strips, by a machine having rotary cutters, which separate it longitudinally as it passes through, transverse cuts being effected by the old mode of vibrating shears—Crompton's patent: vol. iv.\* p. 284.

— or mowing lawns by a machine having a rotary cutter with twisted blades acting against a fixed blade—Budding's patent: vol. vi.\* p. 196.

— and excavating earth for canals, &c., by a machine having vibrating pickers and scraping boxes attached to travelling endless chains, like a dredging machine—Palmer's patent: vol. vii.\* p. 314.

— marble, wood, &c., into bas reliefs by a drilling operation, regulated by a pattern as a guide—Gibbs's patent: vol. ix.\* p. 209.

**CUTLERY**, improvements in making gold and silver knives with steel edges—Thomason's patent: vol. ii. p. 184.

— an improved manufacture of, by passing steel in a heated state between rollers which have indentations suited to form the shoulders and tangs of table knives, and the prongs of forks—Smith's patent: vol. ii.\* p. 153.

**CYLINDERS** of iron applied to the making of masts, yards, and bowsprits—Bill's patent: vol. i. p. 357.

— strengthened internally by hoops for the above purpose—Bill's patent: vol. iv. p. 179.

— or pipes cast by forcing melted metal through a mould having a core—Hague's patent: vol. v. p. 76.

— for carding engines made with an external coating of plaster—Crighton's patent: vol. vii. p. 23.

— of copper for calico printing, made by soldering the copper upon an iron mandril—Attwood's patent: vol. vii. p. 285.

— and pipes, casting them into a mould which descends as the metal flows into it, the core remain-

ing stationary—Gethen's patent: vol. ix. p. 64.

**CYLINDERS** of copper for calico printing, made by hollow tubes fitting on to an iron mandril, and held fast by means of nebs and slots—Attwood's patent: vol. x. p. 307.

— of copper for calico printing, made hollow and driven on to an iron mandril having an elevation, when the iron by being pressed into the copper makes the cylinder fast—Locket's patent: vol. x. p. 364.

— of copper for calico printing, cast in *vacuo*, and under the external pressure of the atmosphere, to prevent porosity—Church's patent: vol. xi. p. 230.

— of iron or steel, for ordnance and other purposes, made by combining a series of bars upon a cylindrical mould, and welding them together on a mandril—Horton's patent: vol. vi.\* p. 334.

**DAMP**, walls of buildings prevented by linings of thin sheet lead: vol. iv. p. 163.

— on iron prevented from producing rust by quick lime and sulphate of soda: vol. ii.\* p. 106.

**DEAD-EYES**, by which masts and rigging are braced, improved construction of—Clark's patent: vol. ii.\* p. 339.

**DECAY** of timber, the indications of, described: vol. i.\* p. 307.

**DECOMPOSING**, offensive vapours from soap boiling, &c., by conducting the vapour into the furnace of the boiler—London's patent: vol. i. p. 184.

**DEFORMITY** of the human figure corrected by improved apparatus—Feuillade's patent: vol. i. p. 247.

— and spiral weakness, apparatus to correct—Gardner's patent: vol. iv. p. 241.

**DENSITY** of the atmosphere, experiments upon, in a balloon: vol. iii. p. 168.

**DIAMONDS**, machinery for washing the earth from, in mines—Harsleben's patent: vol. ii.\* p. 79.

**DIORAMA**, improved mode of exhibiting scenery, and producing a novel effect from—Arrowsmith's patent: vol. ix. p. 337.

**DIES**, improved composition of earthy material for embossing paper, and for forming architectural devices—Brook's patent: vol. xi. p. 88.

— mode of hardening steel for stamping and coining: vol. xii. p. 35.

— softening and hardening steel for, and the apparatus for effecting it: vol. i.\* p. 129.

— and taps, improved form of: vol. i.\* p. 193.

**DIGGING**, mode of excavating for a canal during frost: vol. xiii. p. 220.

**DISCOVERIES**, Freycinet's voyage for investigating the form of the globe and theory of magnetism, account of: vol. ii. p. 313.

— notice of Franklin's voyage towards the north pole: vol. iv. p. 26).

— notice of the loss of the ship *Fury* on its voyage in the Polar Sea: vol. x. p. 377.

— notice of Lander's in the interior of Africa: vol. vii.\* p. 240.

**DISTILLING**, apparatus for performing the operation in *vacuo*—Barry's patent: vol. i. p. 23.

— a mode of rendering metallic retorts proof against the effects of acid, and of promoting the operation of—Gibbon's and Wilkinson's patent: vol. iii. p. 19.

— notice of M. Dubrunfaut's process practised in France: vol. iii. p. 328.

— peculiar apparatus for—Wright's patent: vol. v. p. 180.

— consuming smoke in the still, causing the fuel to burn in condensed air, reducing the atmospheric pressure, and an improved mode of cooling—Arnott's patent: vol. v. p. 225.

— by passing the wash in a current over the heated surface of the boiler—Perrier's patent: vol. vi. p. 65.

— new construction of boiler with an extended flat top for—Smith's patent: vol. vii. p. 1

— apparatus to produce

highly rectified spirit from the still at one operation—Winter's patent: vol. viii. p. 301.

DISTILLING improved mode of producing spirits of turpentine: vol. viii. p. 88.

— and drying various substances in a coffee roasting apparatus—Evans's patent: vol. ix. p. 72.

— from potatoes, by a peculiar process and apparatus—Saintmarc's patent: vol. x. p. 77.

— facilitating the operation by the introduction of metallic wires as conductors of heat: vol. x. p. 160.

— for heating liquors in the operation of, by placing the containing vessels above the boiler: vol. x. p. 295.

— sea water by a cooking stove: vol. x. p. 375.

— a safe to prevent the surreptitious removal of spirits—Fox's patent: vol. xii. p. 350.

— apparatus to catch the aqueous parts of the vapour, and to conduct it back to the still—Grimble's patent: vol. xiii. p. 190.

— apparatus to effect the perfect distillation at one operation—Saintmarc's patent: vol. xiii. p. 198.

— heating by steam, to conduct the operation at different temperatures—Lorent's patent: vol. xiii. p. 259.

— by agitating the wash in the still, and by employing grain which has been soaked, not malted—Evans's patent: vol. xiv. p. 10.

— for the economical preparation of aromatic liquors by a peculiar apparatus: vol. xiv. p. 41.

— by the employment of a medial fluid of a dense quality between the fire and the boiler—Gamble's patent: vol. xiv. p. 130.

— application of the heat evolved from the still to the heating of another still or wash in a distinct vessel—Fraser's patent: vol. xiv. p. 244.

— a refrigerator formed by a long cylindrical vessel coated with cloth, which is to be kept constantly wet—Deurbroucq's patent: vol. xiv. p. 326.

DISTILLING and rectifying spirits by means of pulverised charcoal—M', Curdy's patent: vol. i.\* p. 358.

— economy in the operation of, by mixing spent wash with the fresh wort—More's patent: vol. ii.\* p. 98.

— a process to recover the spirits used in dissolving gums employed for stiffening hats—Wilson's patent: vol. iii.\* p. 94.

— connecting two stills together, and causing the vapour emitted from one to heat the other—Shears's patent: vol. vii.\* p. 61.

— connecting a series of stills, and passing the vapour from one to another, for the purpose of heating the wash of all the stills in the series from one fire—Stein's patent: vol. vii.\* p. 141.

— an improved arrangement of chambers for separating the alcohol from the wash, and also a refrigerator formed by a peculiar arrangement of tubes—Coffey's patent: vol. vii.\* p. 328.

— an apparatus for regulating temperature in carrying on the process of distillation, which is constructed on the principle of the compensating balance of a chronometer—Ure's patent: vol. viii.\* p. 307.

— an arrangement of apparatus with shelves, on which the wash in passing into the alembic is very extensively exposed in a thin stream to the hot vapour—Ure's patent: vol. viii.\* p. 310.

— apparatus to be placed upon a still-head for the purpose of separating the vapours—Phillipe's patent: vol. ix.\* p. 138.

— a still in which the wash is presented to the heating surface in a shower—Stein's patent: vol. ix.\* p. 142.

— a peculiar arrangement of apparatus in which the vapour proceeds from one vessel to another and becomes

condensed in each according to its specific gravity—Shand's patent: vol. ix.\* p. 173.

**DISTILLING**, the heat is communicated through a hot oil-bath, but in the event of the oil giving out gas that is condensed, by passing up a serpentine pipe to a vessel of cold water—Shand's patent: vol. ix.\* p. 183.

**DIVING** apparatus, notice of: vol. x. p. 269.

— a dress to be worn under water with a hood, having eyeholes, and a reservoir with condensed air to enable the diver to move about and work—James's patent: vol. xi. p. 1.

— a bell of observation connected to an ordinary working bell opening to an air chamber above, by means of which persons above and below may converse together—Steel's patent: vol. xi. p. 239.

**DOORS**, an apparatus for suspending and securing, and windows consisting of springs with rollers affixed to the stiles—Newmarch and Bonner's patent: vol. xii. p. 113.

— a bent lever to be employed in place of spring hinges for closing: vol. xiii. p. 166.

— lock having a rotary tumbler and a lever tumbler, both of which must be made to coincide before the bolt can be shidden—Young's patent: vol. xiii. p. 196.

**DOUBLING** and spinning filaments of cotton, &c., by a peculiar mode of conducting the threads over guide rollers to give uniform tension—Taylor's patent: vol. viii. p. 288.

— and twisting cotton, &c., by a simultaneous operation—Gimson's patent: vol. ix. p. 414.

— twisting and spinning; the improvement is a mode of retarding the bobbin by the friction of a weighted cord—Leach's patent: vol. ix. p. 304.

— tension of the thread regulated and accommodated, and the combining of several bobbins—Badnal's patent: vol. xii. p. 300.

— twisting and spinning, a new arrangement of, vertical and ho-

horizontal spindles and bobbins—Farnshaw's patent: vol. xiii. p. 265.

**DOUBLING**, a confused and unintelligible specification, from which nothing can be understood—Booth and Bailey's patent: vol. xiii. p. 25.

— keeping the fibres of the yarn in the same directions in which they came from the carding engine, throughout all the operations of spinning, doubling, &c.—Smith's patent: vol. xiv. p. 23.

twisting, roving, &c., improved means of driving the machinery, of throwing it in and out of gear, and preserving the tension of the threads—De Jongh's patent: vol. vi.\* p. 91.

—. See also spinning and twisting cotton, silk, &c.

**DOUGH**, machine for fermenting, which has a rotary motion: vol. iv.\* p. 219.

— notice of machinery for kneading: vol. iv.\* p. 241.

— machinery for kneading, by means of a square iron frame, revolving within a barrel—Clayton's patent: vol. vii.\* p. 320.

— kneading machine with rollers and beaters—Poole's patent: vol. ix.\* p. 129.

**DRAG**, under the carriage, intended occasionally to be made to rub against the ground, and by its friction to retard the carriage—Huggett's patent: vol. i. p. 279.

— a shoe attached to a lever is let fall by a chain from the coach box—Johnson's patent: vol. viii. p. 198.

— a shoe attached to a double lever, like a human leg with a knee joint, which is let fall by a chain from the coach box—Parker's patent: vol. ix.\* p. 127.

**DRAINING** land, observation on the process and advantages of: vol. ii. p. 370.

**DRAWING**, notice of an improved transparent paper for tracing: vol. i. p. 129.

— wire in the draw plate, through holes which have been jewelled—Brockdon's patent: vol. i. p. 252.

DRAWING, notice of Craig's lectures on the art of: vol. iii. p. 39.

— paper tablets, for, formed by couching and pressing several sheets of pulp together: vol. iii. p. 262.

— a mechanical apparatus, for tracing the outlines of a figure, or other object, on paper—Ronald's patent: vol. xii. p. 21.

— See roving and spinning cotton, wool, &c.

DRESSING woollen cloths by pointed wire cards, and beating the cloths in a boiler when tightly rolled, in order to produce a permanent gloss—Daniell's patent: vol. i. p. 29.

— warps for weaving, an improved paste for: vol. iii. p. 162.

— lace, singeing off the downy fibres, by passing it in an extended sheet through heated air—Donkin's patent: vol. viii. p. 239.

— flax and hemp, without previously steeping it: vol. viii. p. 268.

— or singeing cotton and other woven goods, by the flame of gas, oil, or spirits—Burn's patent: vol. ix. p. 4.

— woollen cloth by immersing it in a steam-bath when rolled up tight: vol. ix. p. 77.

— and beaming silk and other warps by a machine, which in the threads or yarns are drawn from spools or bobbins, spread out, sized by a brush, and wound upon a beam ready for the weaver—Horrock's patent: vol. ix. p. 179.

— woollen cloths, by a peculiar construction of brushing machine—Jones's patent: vol. ix. p. 230.

— brushing and shearing woollen cloth by machinery, having rotary brushes and rotary cutters—Davis's patent: vol. ix. p. 290.

— and stiffening warps in the loom, by means of rollers conducting size, and a revolving brush to distribute it, with a vibratory fan to promote its drying—Wells's patent: vol. ix. p. 241.

— stones by a machine, carrying a vibrating chisel, which pecks the surface of the stones as it passes un-

der it—Dallas's patent: vol. ix. p. 301.

DRESSING woollen cloth, by grinding off the ends of the pile by a revolving cylinder coated with emery, or other cutting materials—Slater's patent: vol. ix. p. 406.

— woollen cloth by means of wire cards in a gig mill, in conjunction with revolving heated boxes on the gig barrel, which fix the pile or nap—Daniell's patent: vol. x. p. 71.

— woollen cloth by a doubled barrelled gig with teasles, and by a pressing apparatus heated by steam—Lord, Robinson, and Forster's patent: vol. xi. p. 5.

— woollen cloth by a double barrelled gig with teasles, and apparatus to press the cloth, with any required force against the teasles: Hirst and Wood's patent: vol. xi. p. 281.

— by the preceding machine, but with additions which cause the cloth to be brought against both the backs and fronts of the gig barrels, and thereby to be more effectively operated upon—Hirst, Wood and Rogerson's patent: vol. xi. p. 282.

— flour in a bolting mill, in which a more uniform action of the bolting cloth is obtained by elastic arms to which the tail leather is attached—Ayton's patent: vol. xii. p. 11.

— woollen cloth by a brushing and steaming apparatus—Haycock's patent: vol. xii. p. 132.

— woollen cloth by teasles set in small cylinders—Sheppard and Flint's patent: vol. xiii. p. 88.

— and combing wool and waste silk by a machine, in which the material is introduced between a pair of rollers, and combed by a revolving porcupine roller—Anderton's patent: vol. xiii. p. 181.

— flax and hemp by heckles fixed upon a flexible endless sheet, which travels under the stick of fax—Garsed's patent: vol. xiii. p. 185.

— woollen cloth by improved wire cards, some being very fine and sharp pointed, intermixed with others, as

protectors, which are stiff and blunt

—Daniell's patent: vol. i.\* p. 227.

DRESSING woollen cloth by working its surface with hand cards, the cloth being distended upon a hard, flat surface—Daniell's patent: vol. i.\* p. 344.

— paddy or rice, by a process in which it is first dried and then polished—Lucas and Ewbank's patent: vol. i.\* p. 356.

— hemp and flax by a new mode of conducting a series of travelling heckles—Lawson and Walker's patent: vol. iii.\* p. 83.

— woollen cloth by a machine containing brushes and calendering rollers, which are put in rapid rotary motion for the purpose of laying the pile and putting a lustre on the cloth—Haden's patent: vol. iii.\* p. 287.

— woollen cloths in a gig, the teasles being guarded by rollers mounted on the gig barrel—Daniell's patent: vol. iv.\* p. 333.

— woollen cloth in a gig, the teasle frames being mounted on springs to produce a delicacy of operation—Daniell's patent: vol. iv.\* p. 334.

— flour machinery for, constructed with iron ribs to the bolting cylinder, a peculiar mode of fixing the wire-work, and the adaptation of a brush to clean the wire-work—Smith's patent: vol. iv.\* p. 344.

— woollen cloth by the application of smooth plates to its surface, the cloth being distended in a large vat filled with hot water, and pressed by hydrostatic or other means—Jones's patent: vol. viii.\* p. 126.

— woollen cloth by extending the cloths in a large vessel filled with boiling water, and pressing it by flat plates, compressed by cramps and wedges—Jones's patent: vol. viii.\* p. 131.

— woollen cloth in a gig, in which hand cards are employed in place of needles with guard rollers between—Daniell's patent: vol. ix.\* p. 167.

— for shearing and finishing wool and other goods.

DROPS, having a jewel or band at the bottom—Davy's patent: vol. iii.\* p. 309.

DRIFTING of ships partially prevented, by a canvas sail stretched out with iron rods and let down into the sea, its perpendicular position being preserved by a wooden float at top—Burnett's patent: vol. xii. p. 189.

DRILL plough, an apparatus consisting of a series of revolving cups, which, as the plough advances, deliver the seeds in the furrow behind—Torey's patent: vol. ii. p. 16.

DRILLING and dibbling machine; the apparatus is worked by the foot of the husbandman, and as the machine advances the dibbling iron being depressed, causes seed to be dropped into the hole made by the previous operation of the dibble—Coggin's patent: vol. ii.\* p. 88.

DROWNED persons, an apparatus to restore animation, consisting of a peculiarly formed syringe: vol. iii. p. 93.

DRYING promoted by the air pump: vol. i. p. 395.

— grain in a cylindrical vessel placed erect having conical ends, and enclosed by a jacket parallel to its surface; a fire is made within, and the grain being let fall upon the top, slides down between the sides and the jacket, and becomes dried before it passes out at bottom: vol. vii. p. 213.

— calicoes and other goods in a dye-house or bleach-works by a machine, which, in travelling along, rolls in the top of the building, un-winds the cloths and hangs them in loops—Southworth's patent. vol. viii. p. 298.

— drugs or other vegetable matters in a machine which is also suited to roasting coffee—Evans's patent: vol. ix. p. 72.

— oil, a mode of preparing it for painting: vol. iii. p. 138.

DRY-Rot in timber, its probable cause: vol. i. p. 463.

— prevented by the use of volatile oil of tar reduced to a fixed oil, which is to be applied to timber with other ingredients as paint—Oxford's patent: vol. v. p. 69.









